MIZEX: Ice Floe Trajectories through the Greenland Sea

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April 1985

Canadian Data Report of Hydrography and Ocean Sciences No. 33

Canada

85-5817/

Canadian Data Report Of Hydrography and Ocean Sciences

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Rapport statistique canadien sur l'hydrographie et les sciences océaniques

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En général, les rapports contiennent des données brutes ou analysées mais ne fournissent pas d'interprétations des données. Ces compilations sont préparées le plus souvent à l'appui de travaux reliés aux programmes et intérêts du service des Sciences et Levés océaniques (SLO) du ministère des Pêches et des Océans.

Les rapports statistiques sont produits à l'échelon régional mais sont numérotés et placés dans l'index à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page de titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et Levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports depuis décembre 1981. Vous trouverez dans l'index des publications du volume 38 du *Journal canadien des sciences halieutiques et aquatiques*, la liste de ces publications ainsi que le dernier numéro paru dans chaque catégorie. La nouvelle série a commencé avec la publication du Rapport n° 1 en janvier 1982.

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c Minister of Supply and Services Canada 1985

Cat.No.Fs 97-16/33E ISSN 0711-6721

Correct citation for this publication:

Symonds,G. and Peterson,I.K. 1985. MIZEX: Ice floe trajectories through the Greenland Sea. Can. Data Rep. Hydrogr. Ocean Sci. 33 : iv + 68 p.

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ABSTRACT

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As part of the Marginal Ice Zone Experiment (MIZEX), ice drift through the Fram Strait and Greenland Sea has been observed in two successive summers, 1983 and 1984. The trajectories were obtained by tracking selected floes "marked" with automatic data buoys using the ARGOS location system. From successive fixes, the displacement over a known time provides an estimate of the ice velocity. In total, 710 buoy days of data were obtained: the data for each buoy are reported here. The trajectories and velocity time-series are presented together with tabulated daily positions and velocity.

RÉSUMÉ

Symonds,G. and Peterson,I.K. 1985. MIZEX: Ice floe trajectories through the Greenland Sea. Can. Data Rep. Hydrogr. Ocean Sci. 33 : iv + 68 p.

Dans le cadre de l'Expérience sur la zone des glaces (MIZEX), le transport glaciel constaté dans le détroit du Fram et la mer du Groënland a été observé au cours de 2 étés successifs, soit en 1983 et 1984. Les trajectoires sont obtenues en pistant certains floes "marqués" au moyen de bouées collectant automatiquement des données à l'aide du système de localisation ARGOS. Comme le point a été fait à différents points successifs, le déplacement sur une période donnée fournit une vitesse estimative des glaces. En tout, 710 jours-bouées de donnees ont été obtenus. Les données de chaque bouée sont indiquées ici. Les trajectoires et les séries chronologiques de vitesses sont présentées conjointement aux tableaux de positions et de vitesses quotidiennes.

INTRODUCTION

The Marginal Ice Zone Experiment (MIZEX) was an international effort to investigate air-sea-ice interaction in the zone defined by the maximum and minimum extent of sea ice, known as the marginal ice zone. The experiment was located in Fram Strait between Svalbard and Greenland and took place during the summers of 1983 and 1984. More than one hundred scientists from ten nations participated. The broad objectives of the MIZEX program were to investigate air-sea-ice interaction on time scales of 10^2 - 10^6 seconds and space scales of 10^2 - 10^5 meters. The scope of the experiment encompassed all aspects of air-sea-ice interaction with sub-programs in each of the major disciplines; oceanography, meteorology, sea ice, remote sensing, biology and acoustics. Objectives were defined within each sub-program and were addressed by specific experiments conducted by independent researchers. For a detailed description of the MIZEX program see Johannessen et al (1982).

The Atlantic Oceanographic Laboratory participated in the sea ice sub-program of MIZEX by deploying an array of satellite tracked drifters on the ice to investigate sea ice motion at scales of 100km. These buoys provide location (latitude and longitude) through the ARGOS system with an accuracy of a few hundred meters approximately 10 times per day. In 1984 three buoys were equipped with anemometers providing approximately ten minute averages of wind speed and direction with one minute sampling about fifteen times per day. The objective was to identify the relative importance of oceanic and atmospheric forcing and the effect of stresses within the ice pack itself affecting the trajectory of a given ice floe. These data were supplemented by additional buoys deployed at the same scale by O.Johannesson of the University of Bergen. Measurements of ice deformation at scales of 10km and 10 minutes were made by W.D.Hibler of the Cold Regions Research and Engineering Laboratory of the U.S.Army Corps of Engineers.

The purpose of this report is to present the data obtained from the AOL buoys. No attempt is made to interpret the results or perform a detailed analysis. The data are presented in as close to their raw form as practical and includes data from both 1983 and 1984.

DATA SUMMARY

In 1983 six buoys were deployed, three being equipped with atmospheric pressure sensors. However, these sensors are temperature sensitive and due to an oversight a temperature sensor was not included in the buoys. The pressure data are therefore not reported here. A summary of the data return is shown in figure 1a showing the periods of operation for each buoy. Except for buoy 2404 the gaps in the records are periods where a particular buoy was recovered and redeployed for one reason or another. Buoy 2404 malfunctioned shortly after deployment and then began transmitting intermittently about day 215. The deployment locations are shown in figure 1b. In all cases the buoys were deployed by helicopter. Due to problems with the Omega navigation aboard the helicopters the buoys were not deployed in a regular square array as originally planned.

In 1984 twelve buoys were deployed. Two of these were air-deployed by the Norwegian Air Force from a P3 aircraft. The first air-deployed buoy appeared to land on the ice safely but never transmitted a position, while on the second attempt the parachute failed to open. The remaining ten buoys were deployed by helicopters operating from two of the ships participating in the MIZEX program. The data coverage is summarised in figures 2a and 2b. Three of these buoys were equipped with R.M.Young model 5102 propeller-vane wind monitors. At the time of writing this report (January 1985) buoys 2345 and 2346 were still transmitting.

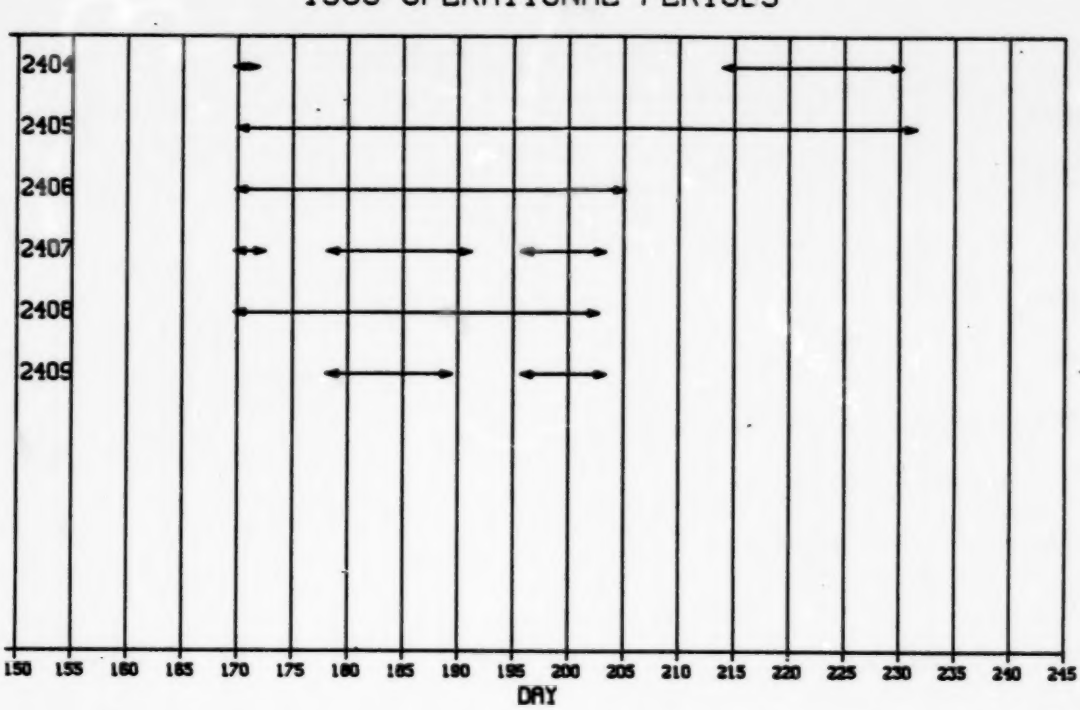

Figure 1a

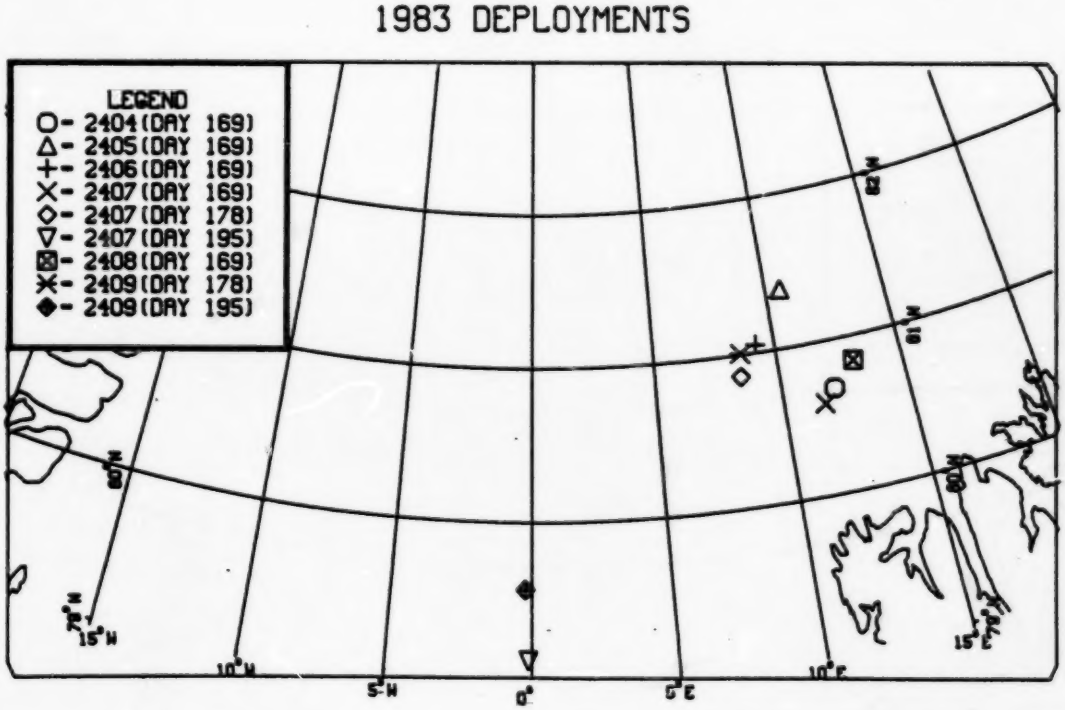

Figure 1b

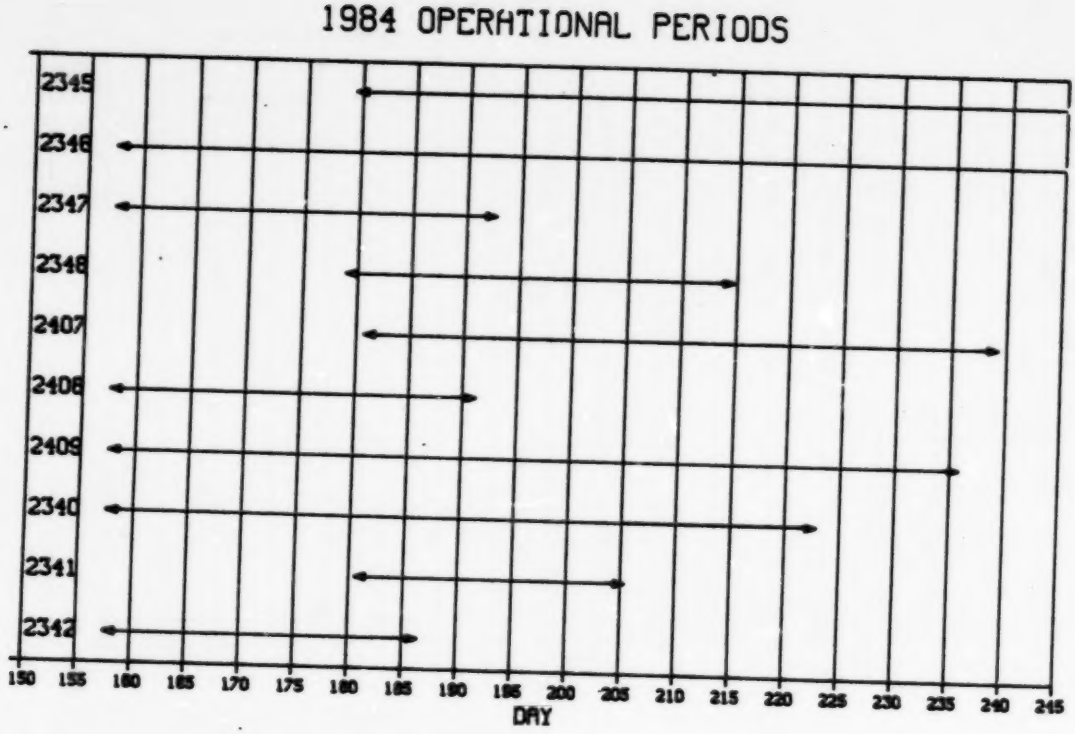

Figure 2a

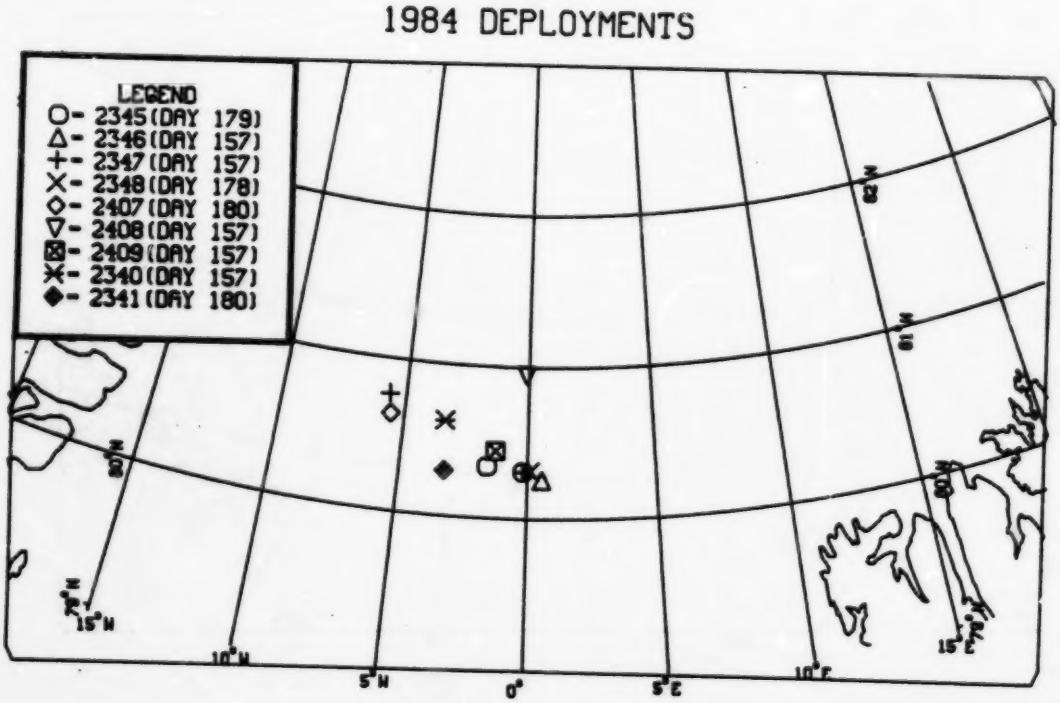

Figure 2b

In this report only data to the end of September are presented.

In figure 3 all of the trajectories from both the 1983 and 1984 deployments are shown. In appendix A the trajectories of individual buoys are plotted. The trajectories shown in figure 3 and in appendix A have been plotted using the raw position data. In appendices B and C the data have been linearly interpolated to three-hourly values. Appendix B contains time series plots of the u and v components of ice velocity derived from successive three hour displacements. The velocity components are obtained in a cartesian frame with the origin at the pole and the x and y axis being projected along the Greenwich meridian and 90°E respectively. The transformation from latitude and longitude to x and y is

$$x = 110.949(90 - \text{lat})\cos(\text{long})$$

$$y = 110.949(90 - \text{lat})\sin(\text{long})$$

where x and y are in kilometers and latitude and longitude are in degrees. In appendix C the same data have been plotted as vector time series.

To illustrate some of the sampling problems the sampling interval in hours between successive fixes for each buoy has been plotted as a time series in appendix D. In 1984 the sampling problem was compounded somewhat due to the failure of one of the satellites (NOAA 7).

Finally in appendix E are tabulated daily latitude and longitude and the corresponding u and v components of velocity for each buoy.

BUOY HISTORIES

In this section a brief description of individual buoy trajectories is given. The data have been subdivided according to year. Basic statistics are also given; the length of the time series in days, the mean velocity components (u,v) cm s^{-1} resolved in the coordinate frame described above, the variance of these components in cm^2s^{-2} and the covariance between u and v in cm^2s^{-2}.

1983-1984 ICE TRACKS

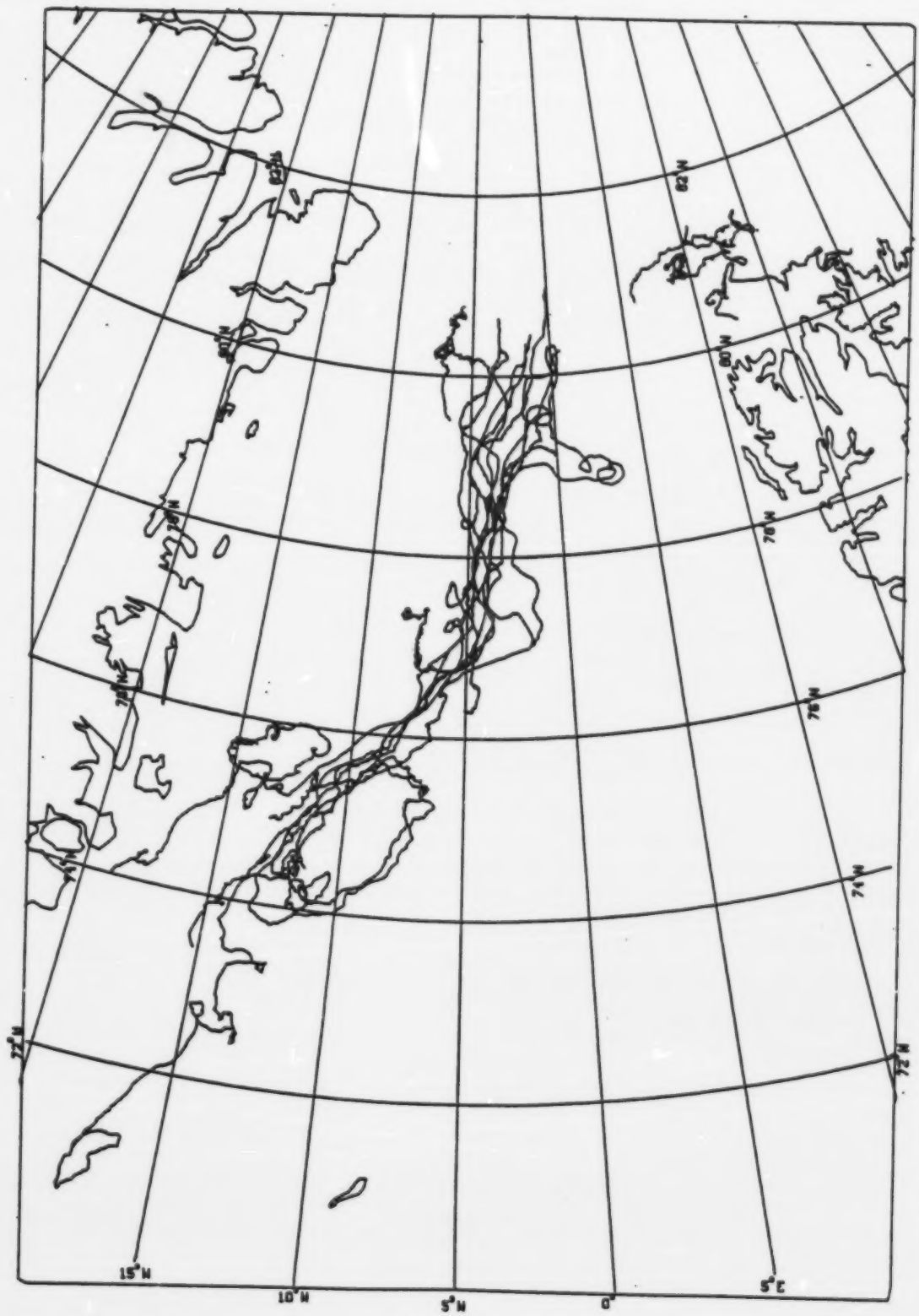

Figure 3

a) 1983

buoy number 2404

length 2

time series too short to estimate other statistics

This buoy ceased operating shortly after deployment for reasons unknown. Intermittent fixes were obtained after day 230 until the buoy finally grounded on the north coast of Spitsbergen. This buoy was found by the NORSK Polar Institut, Norway in the summer of 1984 and subsequently returned to AOL.

buoy number 2405

length 61

mean (1.3,1.1)

variance (23.4,38.2)

covariance -7.2

This buoy provided the longest continuous trajectory in 1983. Significant semi-diurnal oscillations can be observed in the u and v time series. The inertial period for this region is 12.2 hours so that it is not possible to distinguish inertial from tidal motion without further analysis.

buoy number 2406

length 34

mean (1.3,1.2)

variance (32.4,36.7)

covariance -9.6

The trajectory for buoy 2406 is very similar to that for buoy 2405. A comparison of the time series also illustrates the correlation between these two buoys. The slightly higher variance observed at buoy 2406 may reflect the vicinity of the ice edge.

buoy number 2407

first deployment length 2

Shortly after deployment this buoy was recovered because it was feared the buoy would drift out of the main pack into open water.

second deployment length 12

mean (-1.8,1.5)

variance (10.5,23.7)

covariance 2.1

The buoy was redeployed deeper in the pack and formed part of an array of buoys placed about the drifting ship. After the initial deployment of buoys the original buoy array plan was abandoned due to unfavourable drift. Following the drift phase the experiment site was relocated to the south and buoy 2407 was recovered prior to the move.

third deployment length 6

mean (11.9,-10.9)

variance (75.0,35.4)

covariance 19.9

During the ice edge phase of the MIZEX 83 operations buoy 2407 was deployed in the East Greenland Current. The increase in both the mean and variance of the motion is attributed to oceanic forcing.

buoy number 2408

length 32

mean (-0.5,4.6)

variance (45.5,63.1)

covariance -11.9

Buoy 2408 was deployed closest to the ice edge in the northern region and shows the highest variance of the buoys deployed in this region. While the

trajectories of buoys 2405 and 2406 are very similar buoy 2408 shows little similarity with either. Satellite images of the region at the time show that this buoy paralleled the ice edge for much of its trajectory. A tongue of ice seen in the satellite images can be associated with the departure from the mean easterly drift which occurred at approximately 16°E between days 175-180. This buoy was finally recovered off the north coast of Spitsbergen by the Norwegian research vessel RV Lance.

buoy number 2409

first deployment length 10

mean (-1.4,1.6)

variance (7.8,26.5)

covariance -5.8

This buoy was deployed in the vicinity of the drifting ship and recovered at the end of the drift phase. The trajectory is similar to buoy 2407 which was deployed approximately 20km south. In tests prior to the experiment buoy 2409 was found to contain significantly higher noise level in position which is apparent in the time series. It is thought this noise is due to unstable electronics in the transmitter.

second deployment length 6

mean (15.4,-9.8)

variance (13.7,23.0)

covariance 3.7

Buoy 2409 was deployed together with buoy 2407 in the East Greenland Current during the ice edge phase of the MIZEX 83 operations. The large mean reflects the dominant forcing of the E. Greenland Current. Again much of the variance in these data is attributed to instrument noise.

b) 1984

buoy number 2340

length 64

mean (11.2,-6.6)

variance (123.1,87.3)

covariance -29.9

Buoy 2340 was one of three buoys deployed in 1984 equipped with an anemometer. Of the three buoy 2340 was the only one to return acceptable wind speed and direction data. The wind record covers the period from day 164-187 while the position data continues to day 223. It is thought the anemometer failed because the buoy fell over on the ice. In figure 4 the components of wind velocity are plotted together with the corresponding components of ice velocity. There is no statistically significant correlation between wind and ice velocity.

buoy number 2341

length 23

mean (18.9,-3.0)

variance (186.5,67.7)

covariance -18.9

This buoy was deployed in the same geographic location where buoy 2340 was deployed but 23 days later. By this time buoy 2340 was 300km south. Buoy 2341 was also equipped with an anemometer but due to an electronic failure the wind speed data were not acceptable. This buoy was recovered at the end of the MIZEX 84 operations.

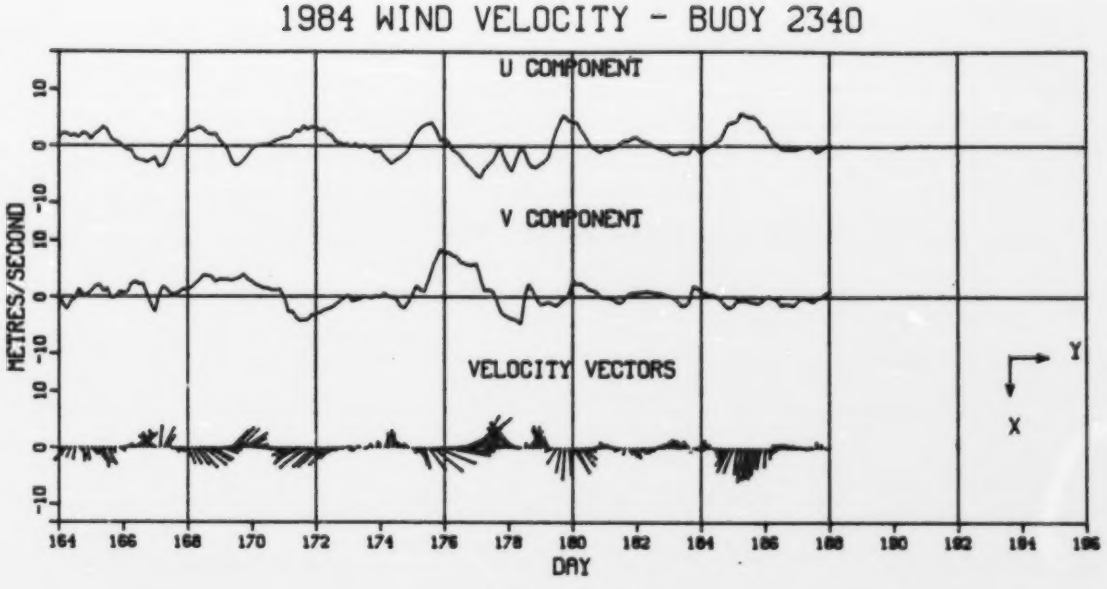

Figure 4a

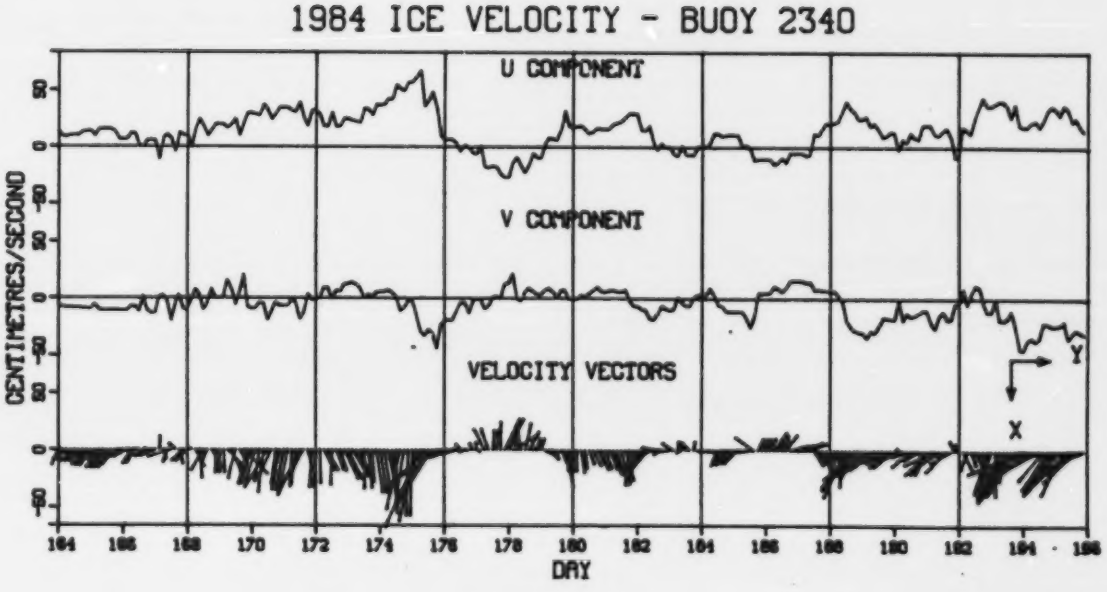

Figure 4b

buoy number 2342

length 27

mean (16.7,-8.4)

variance (165.6,260.3)

covariance -43.6

Buoy 2342 was the third buoy equipped with an anemometer and was deployed at the same time as buoy 2340 but closer to the ice edge. In this case a compass failure meant no wind direction data was obtained. A statistical analysis has shown that there is significant correlation between wind speeds measured at buoys 2340 and 2342.

buoy number 2345

length 94

mean (6.2,-5.7)

variance (144.2,128.0)

covariance -52.9

This buoy was one of the longest lived buoys deployed during MIZEX 84 and was still transmitting at the time of writing this report (January 1985). Of the ten buoys deployed this was one of only two buoys to cross onto the Continental Shelf where it finally became frozen in fast ice near the coast of Greenland at approximately 72°30'N. Over the Shelf significant semi-diurnal oscillations are apparent in the buoy trajectory particularly between days 224-232 as seen in the velocity time series.

buoy number 2346

length 116

mean (7.6,-5.4)

variance (264.9,287.4)

covariance -116.7

Buoy 2346 deployed at 80°15'N, 00°34'W traversed the length of the east Greenland coast passing through Denmark Strait about day 289 and passing Cape Farewell about day 315. This buoy has since described a large cyclonic gyre south of Greenland and was still transmitting in January 1985. Unfortunately it is not possible to know exactly when this buoy left the ice. Ice charts produced by the U.S. Navy, NOAA Joint Ice Center, suggest the buoy was probably in open water at the end of September (day 274). A couple of interesting features are observed in the trajectory of this buoy. Shortly after deployment the buoy apparently became entrained in an eddy in the vicinity of the Molloy Deep, a depression in the local topography. After describing several anti-cyclonic loops at approximately 79°N the buoy returned to the main southward drift of the East Greenland Current. Later between days 210-240 this buoy described a large cyclonic eddy with a diameter of about 200km. Interestingly buoy 2409 described the same eddy and at the same time buoy 2345 moved up onto the Shelf and described a smaller anti-cyclonic eddy.

buoy number 2347

length 34

mean (3.6,-0.5)

variance (29.8,14.5)

covariance -8.3

This buoy was deployed further west than the others close to the Shelf break. The relatively small mean velocity suggests this buoy was outside the

main East Greenland Current. The velocity time series show some semi-diurnal energy. This buoy was recovered towards the end of the MIZEX 84 operations.

buoy number 2348

length 25

mean (14.2,-2.1)

variance (158.4,88.6)

covariance -1.6

Buoy 2348 is one of the shortest trajectories obtained in 1984 since it was part of the second deployment part way through the experiment and was recovered at the end of the MIZEX 84 operations.

buoy number 2407

length 57

mean (6.3,-1.6)

variance (155.7,58.9)

covariance -17.8

This buoy was deployed near the Shelf break and during the next 20 days an easterly component of drift brought the buoy closer to the main core of the East Greenland Current. Around day 220 this buoy moves back onto the Shelf and turns almost due north. During this slow northerly drift significant semi-diurnal oscillations can be observed in the time series plots.

buoy number 2408

length 32

mean (20.0,-10.8)

variance (122.9,67.9)

covariance 4.7

This buoy experienced the largest mean velocity of all the buoys deployed

in 1984.

buoy number 2409

length 77

mean (7.1,-4.5)

variance (263.4,208.9)

covariance -120.0

Together with buoy 2346 this buoy exhibits the largest observed variance of all the buoys deployed in 1984. The noise problems encountered in 1983 with this particular buoy had been corrected and it is felt that the large variance is real. Much of the observed variance may be attributed to the large cyclonic eddy described by both buoys 2409 and 2346 between days 210-240.

ACKNOWLEDGEMENTS

These data could not have been obtained without the logistical support of the MIZEX program including the helicopters and pilots who flew in adverse conditions to deploy the buoys. My thanks go to R. Lindsay and M. McPhee aboard Polarqueen and O. Johannessen and E. Augstein aboard Polarstern for deploying the buoys in 1984. Also my thanks to the crew of the Norwegian P3 for attempting the air deployments. Finally I thank E. Svendsen and the crew of Kvitbjorn for staying to recover two of the buoys after everyone else had gone home.

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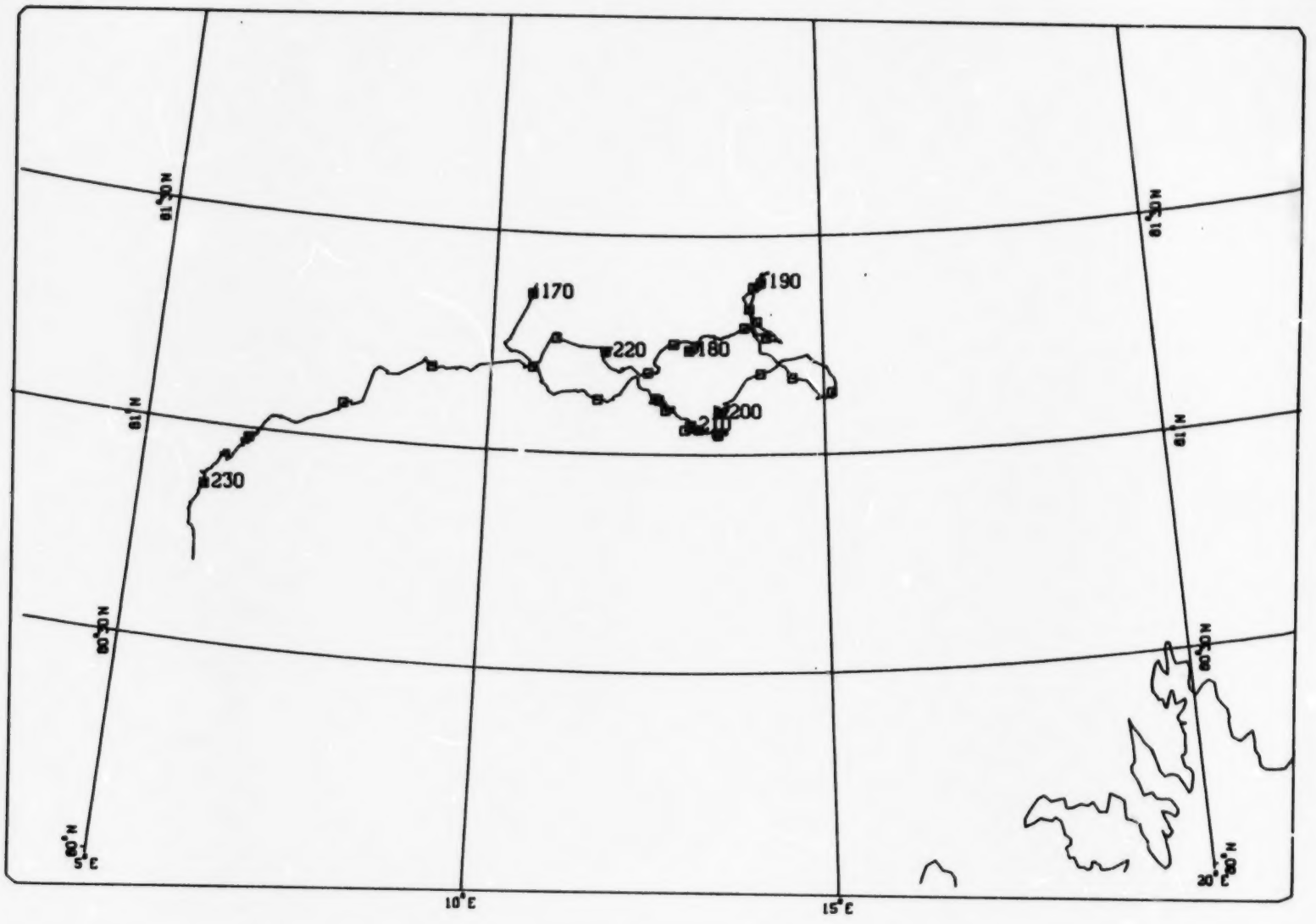
Johannessen,O.M., W.D.Hibler, P.Wadhams, W.J.Campbell, K.Hasselmann, I.Dyer, M.Dunbar (eds), MIZEX A Program for Mesoscale Air-Ice-Ocean Interaction Experiments in Arctic Marginal Ice Zones. II A Science Plan for a Summer Marginal Ice Zone Experiment in the Fram Strait/Greenland Sea: 1984, USA

Cold Regions Research and Engineering Laboratory, Special Report 83-12,1983.

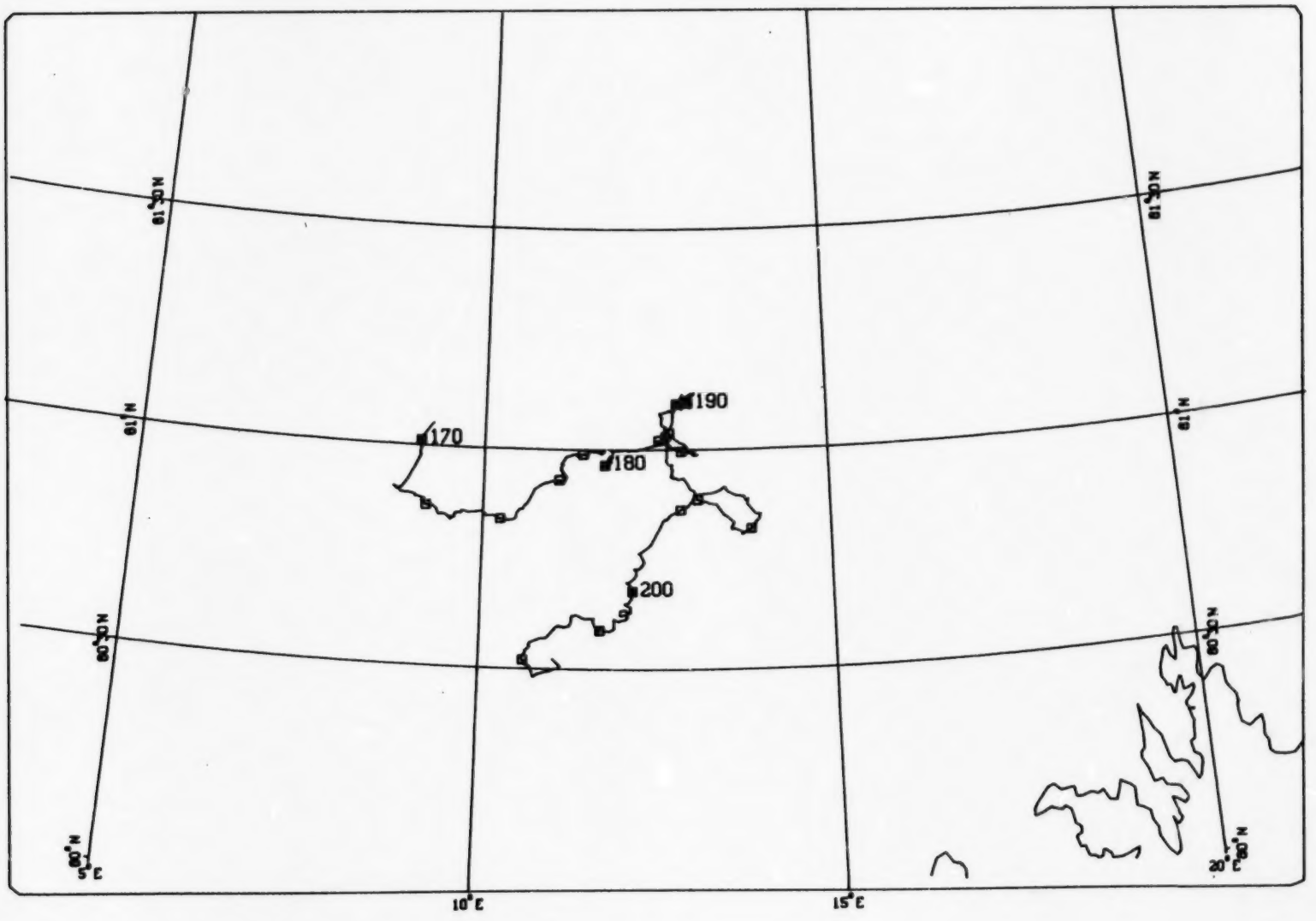
APPENDIX A

BUOY TRAJECTORIES

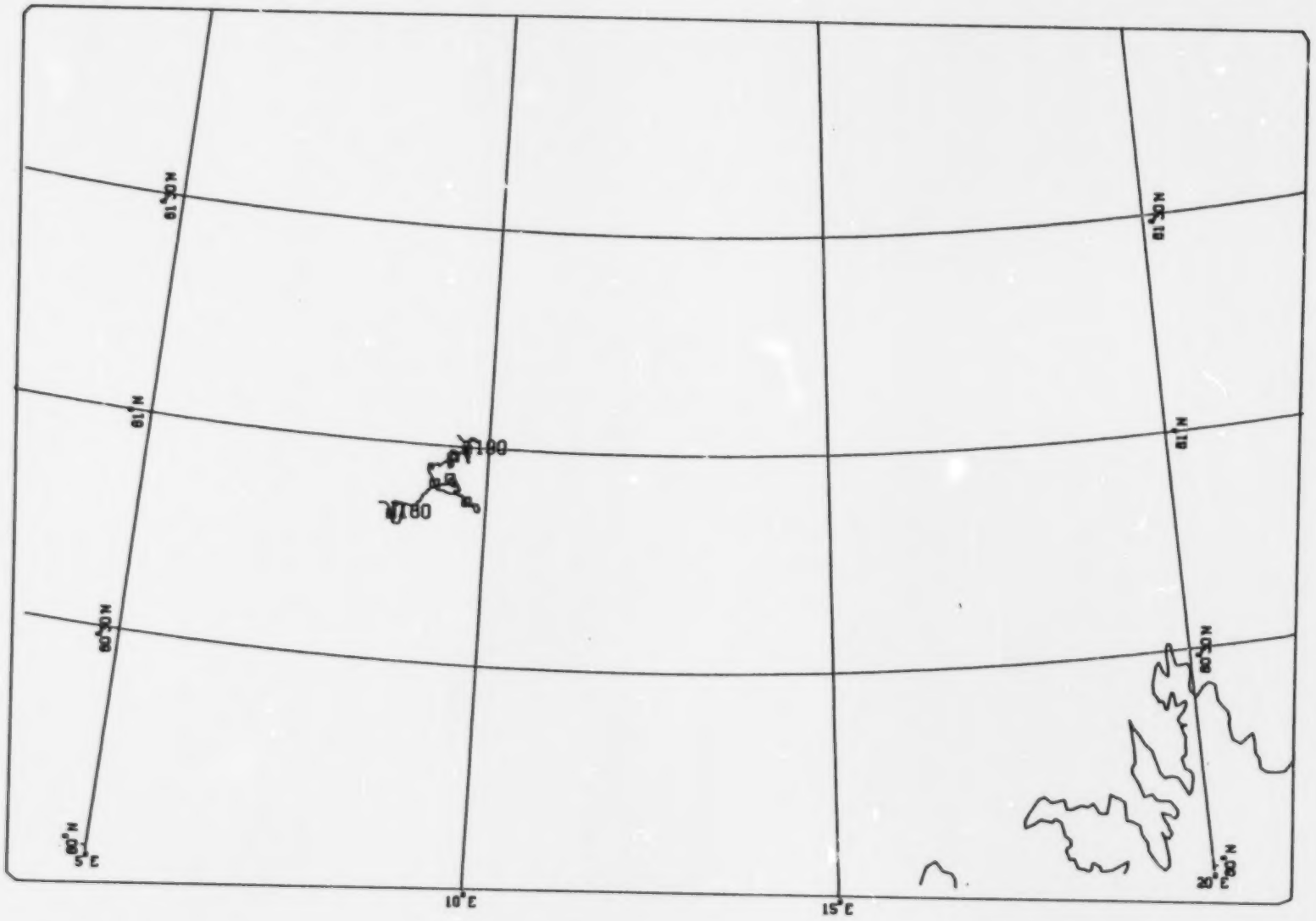
1983 - BUOY 2405



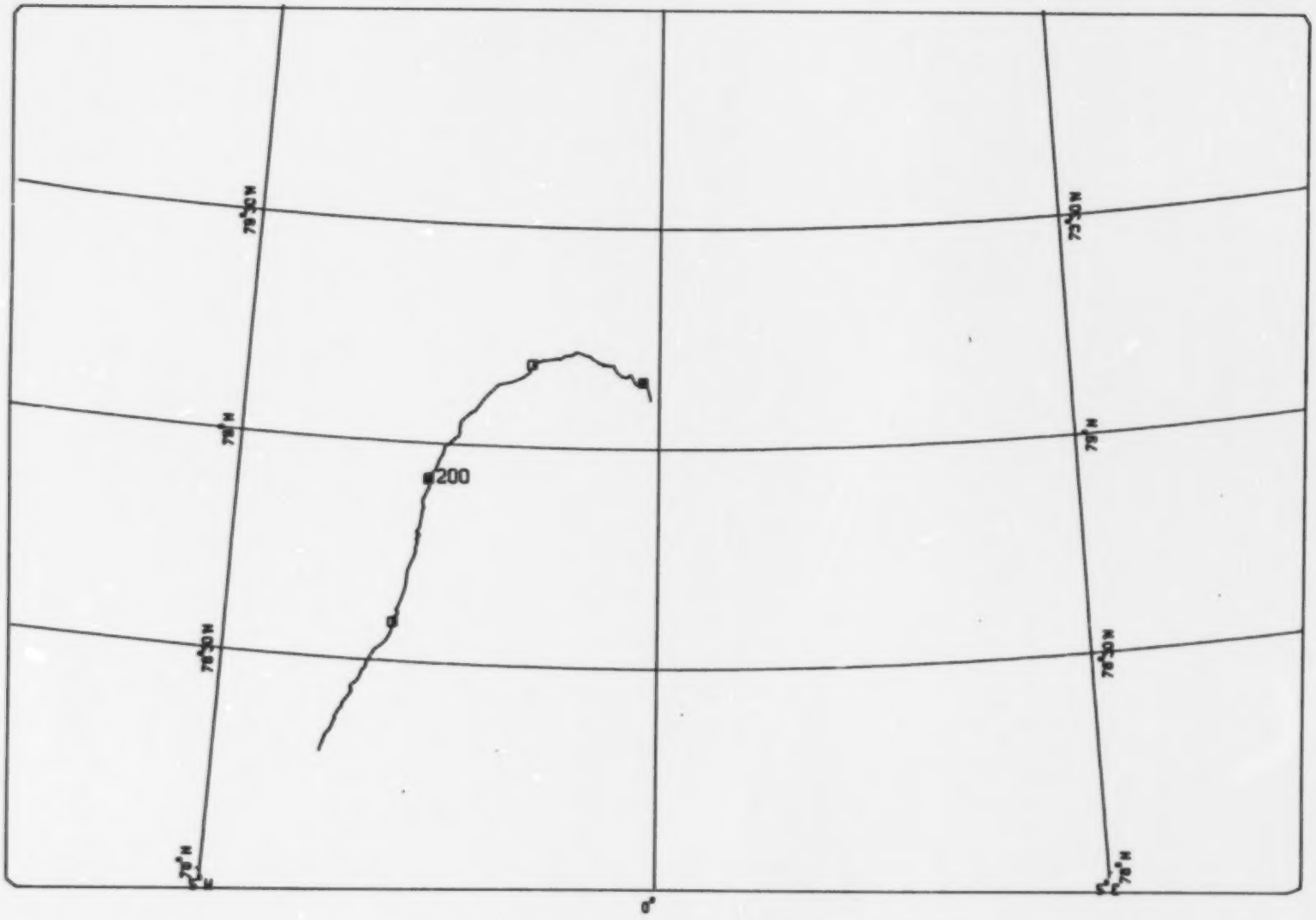
1983 - BUOY 2406



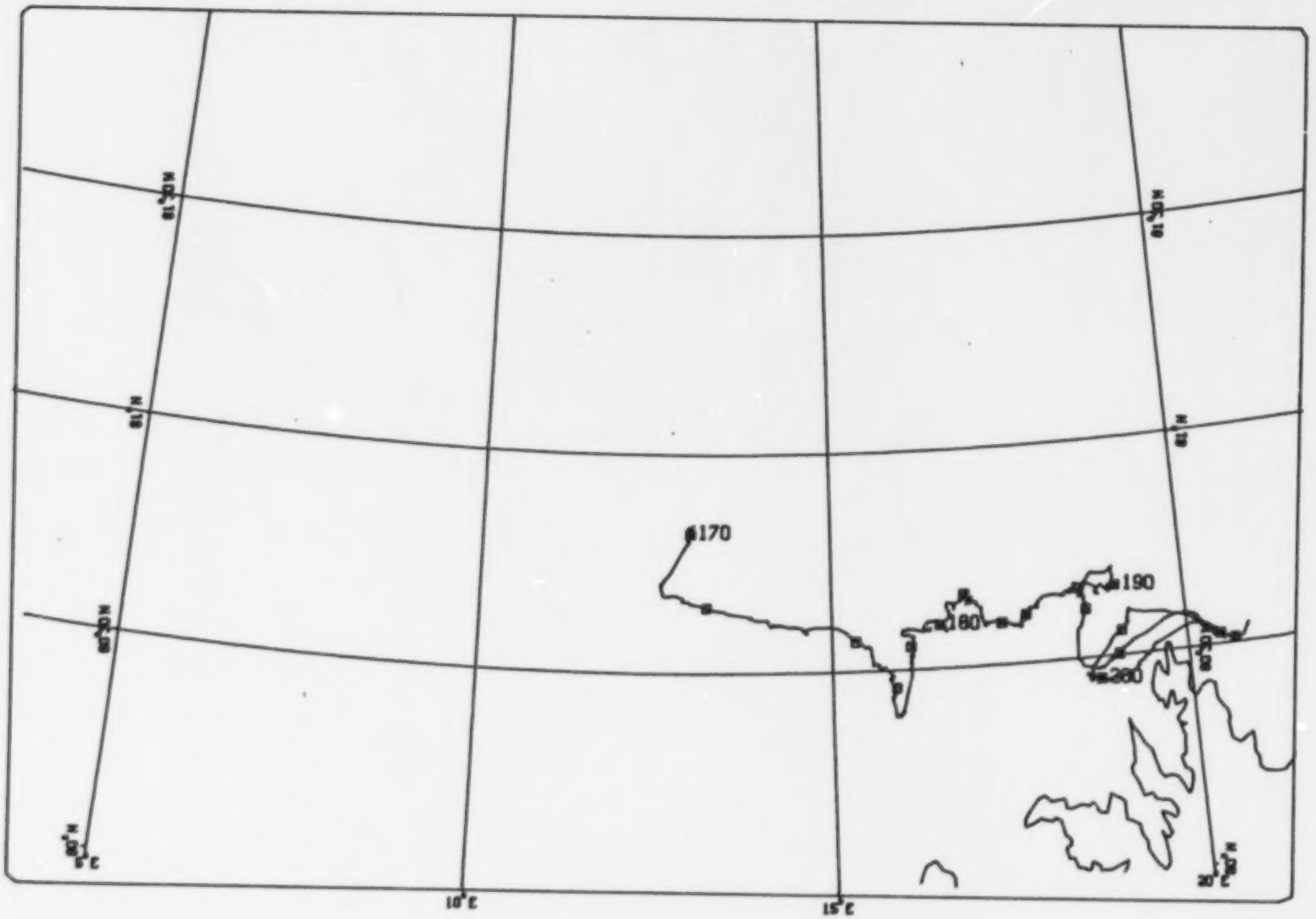
1983 - BUOY 2407



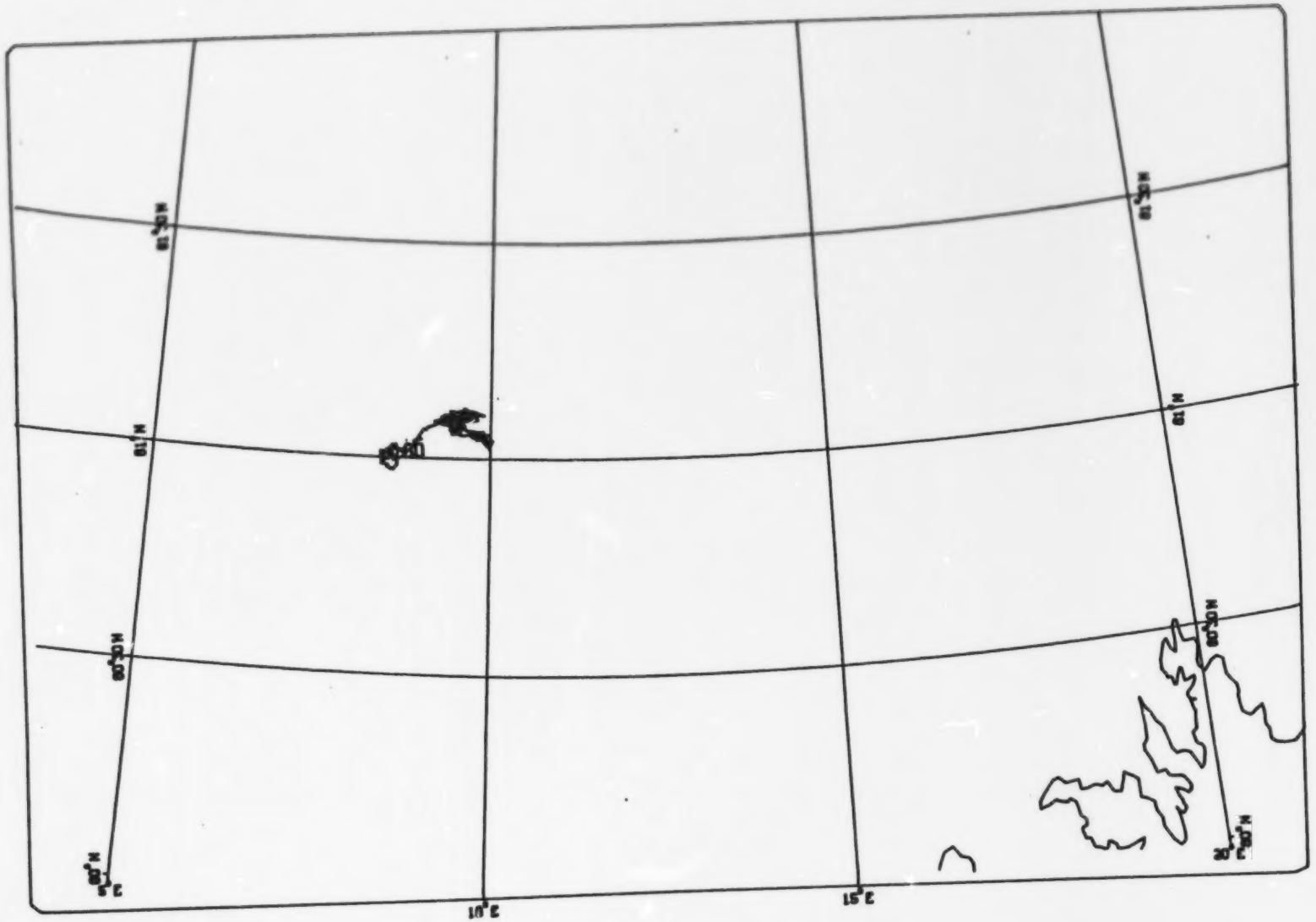
1983 - BUOY 2407



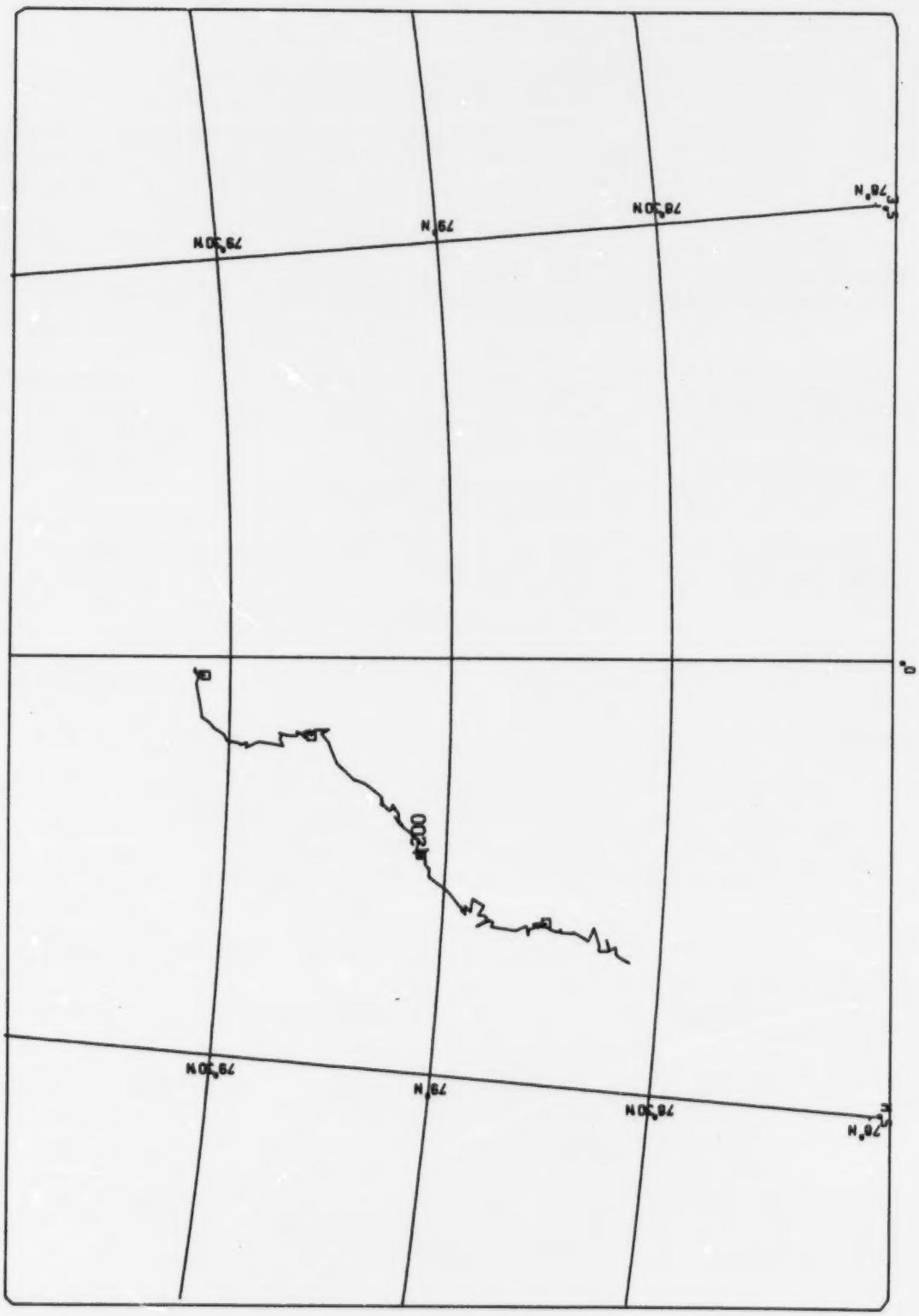
1983 - BUOY 2408



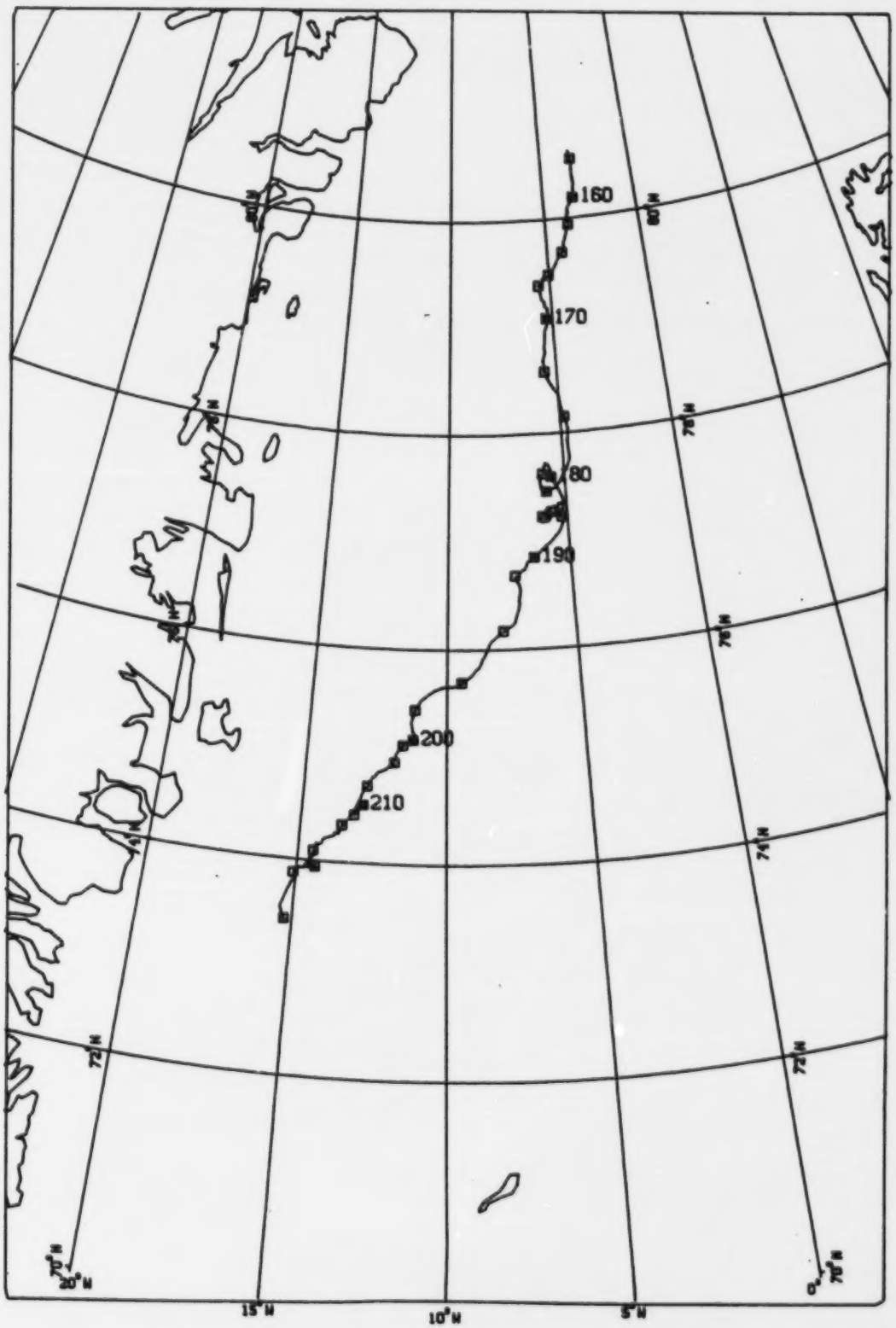
1983 - BUOY 2409



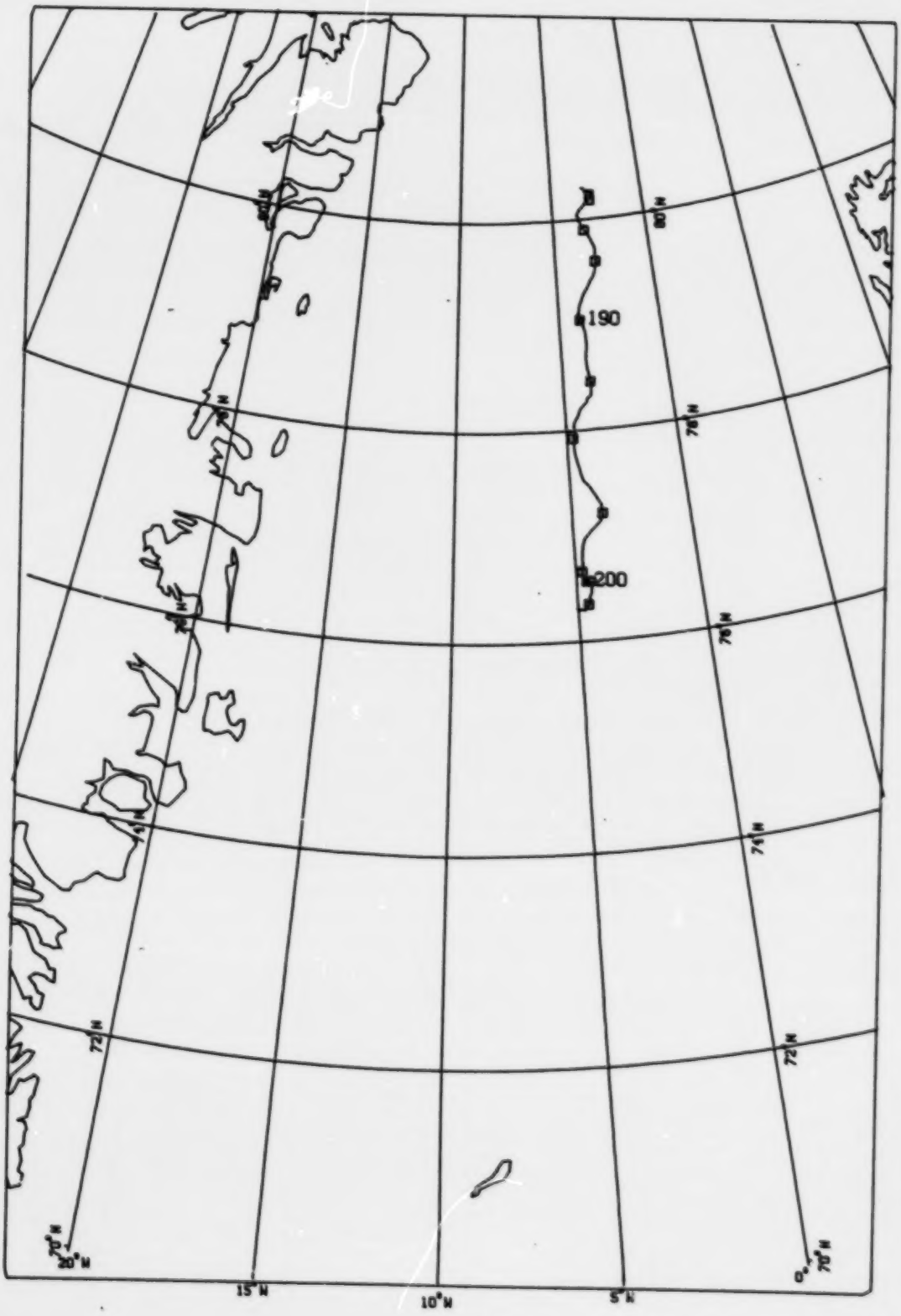
1983 - BUOY 2409



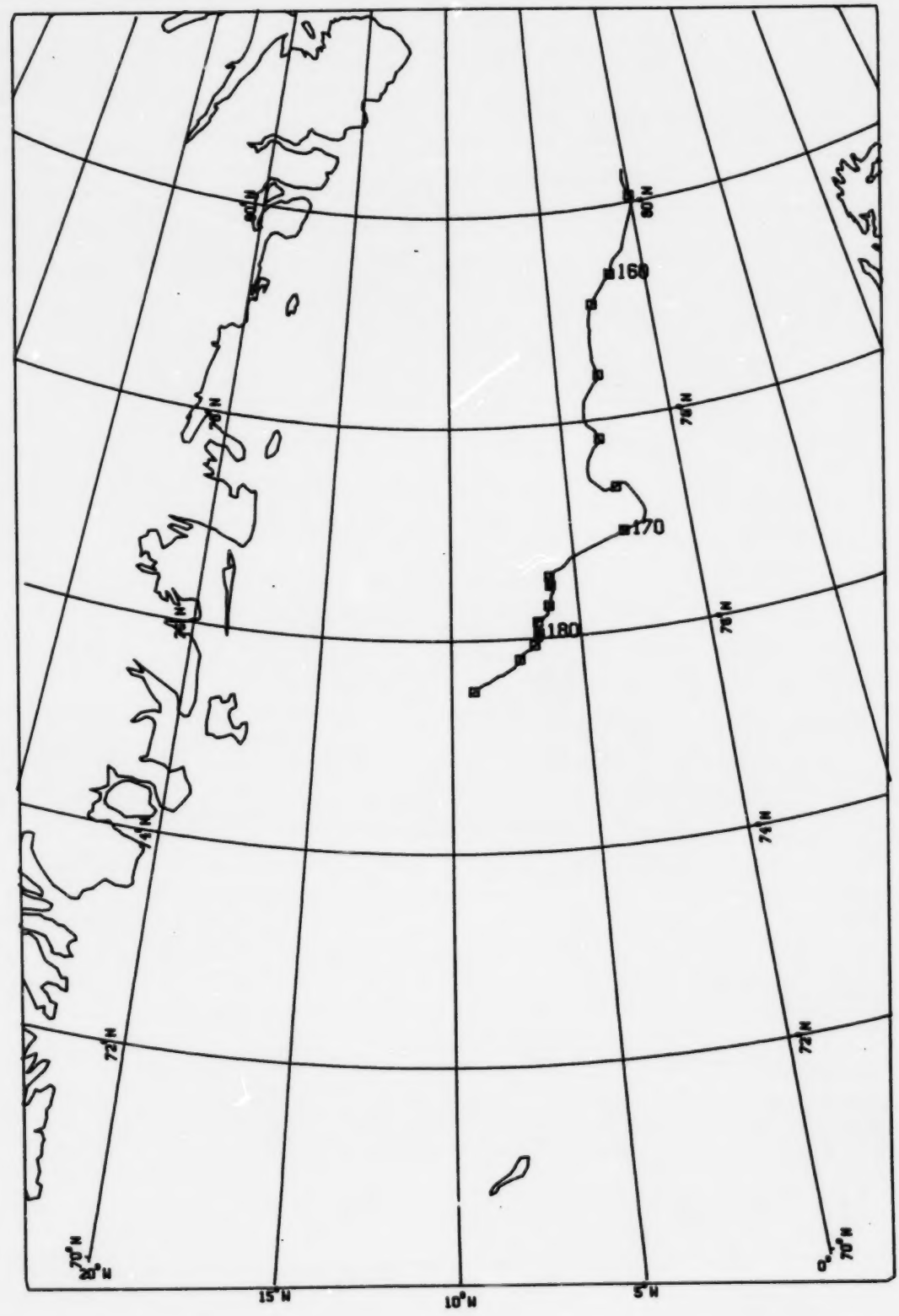
1984 - BUOY 2340



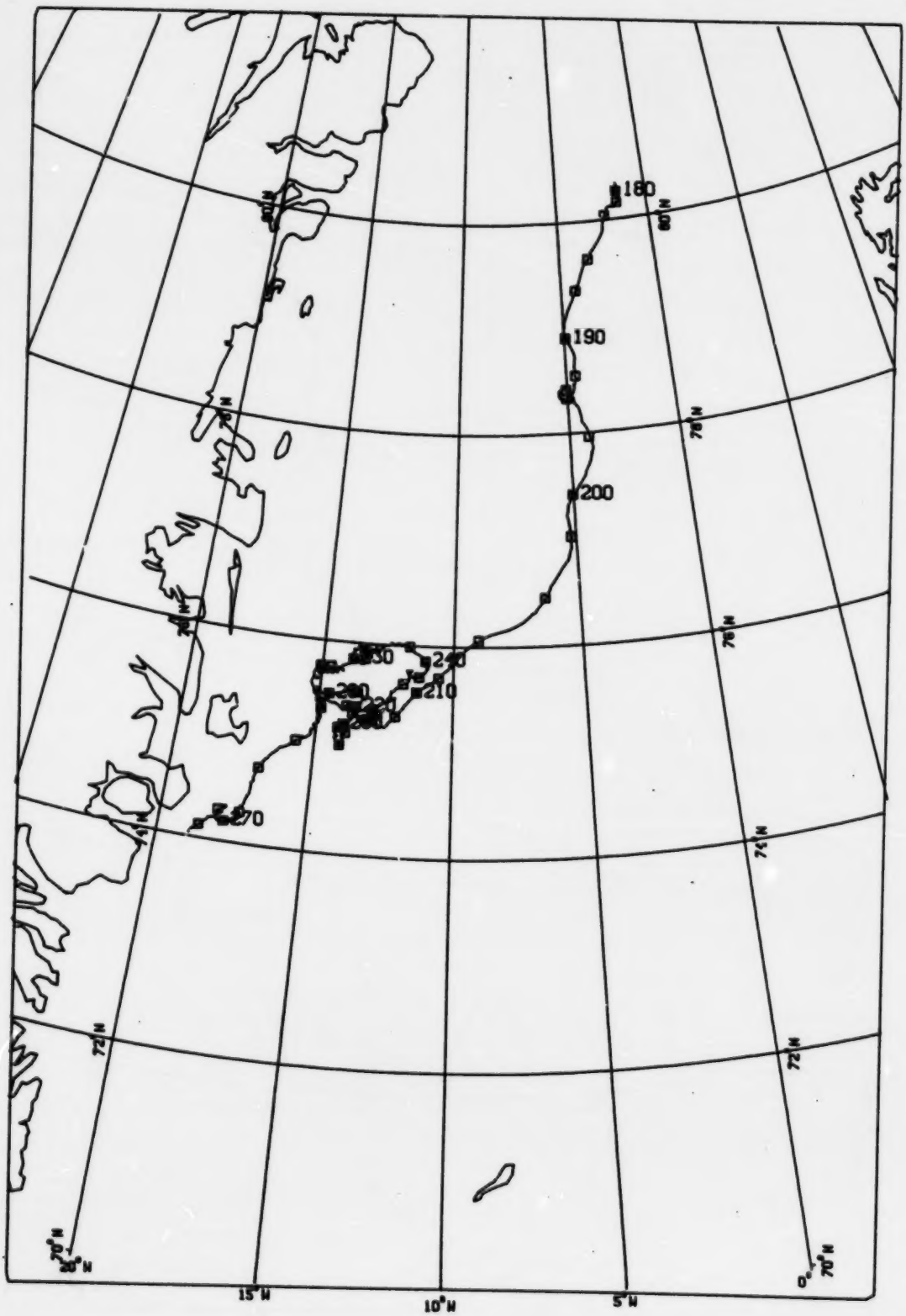
1984 - BUOY 2341



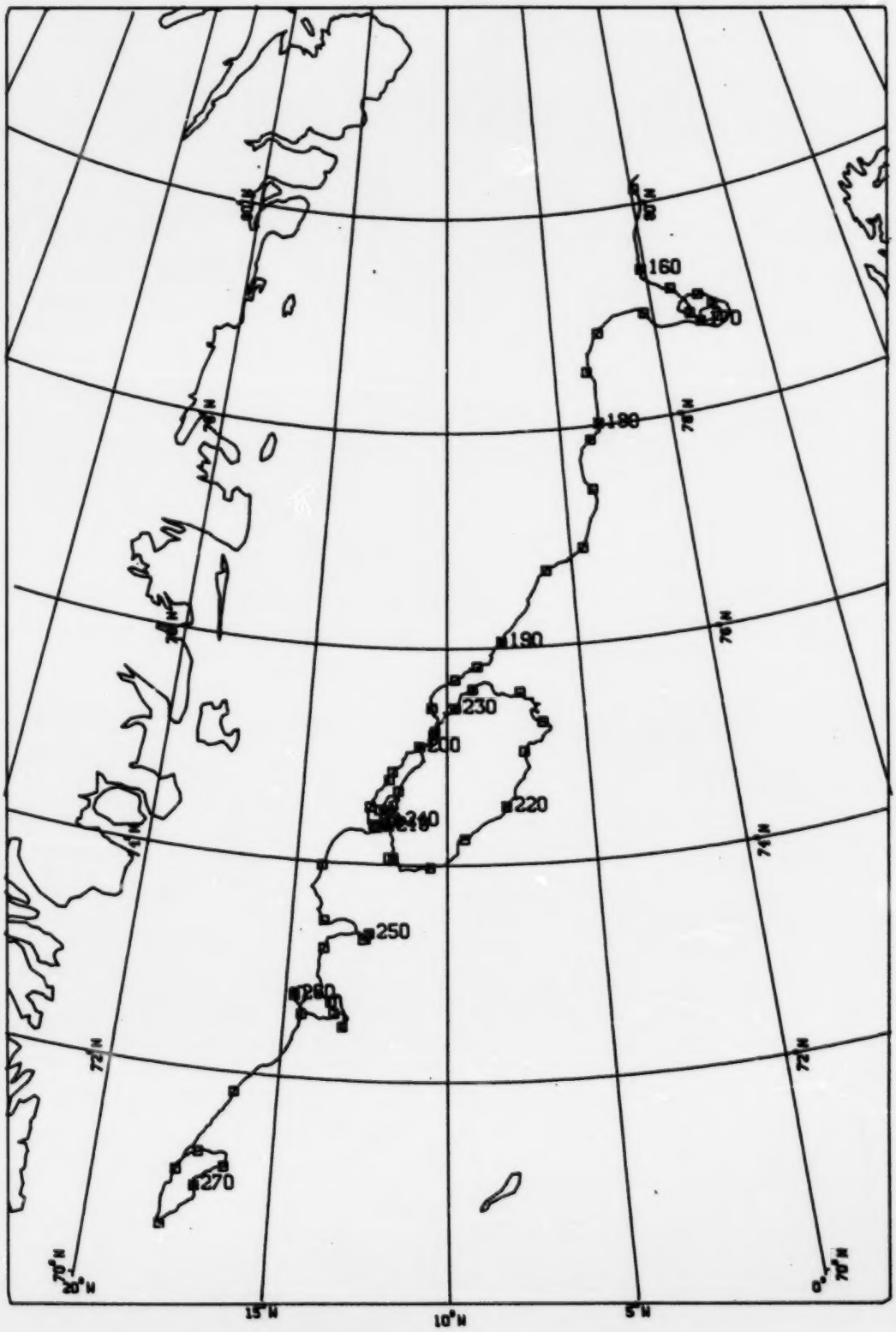
1984 - BUOY 2342



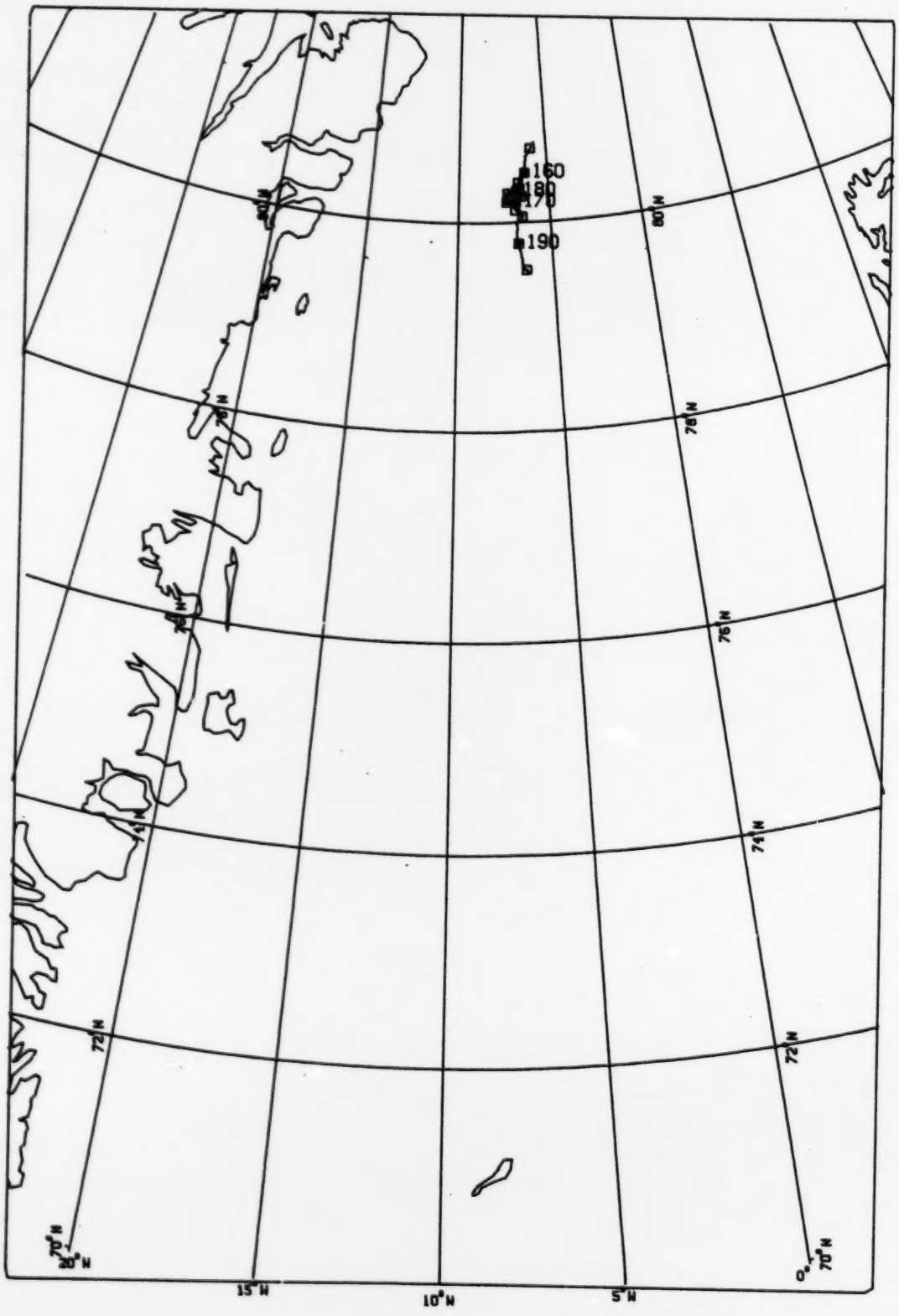
1984 - BUOY 2345



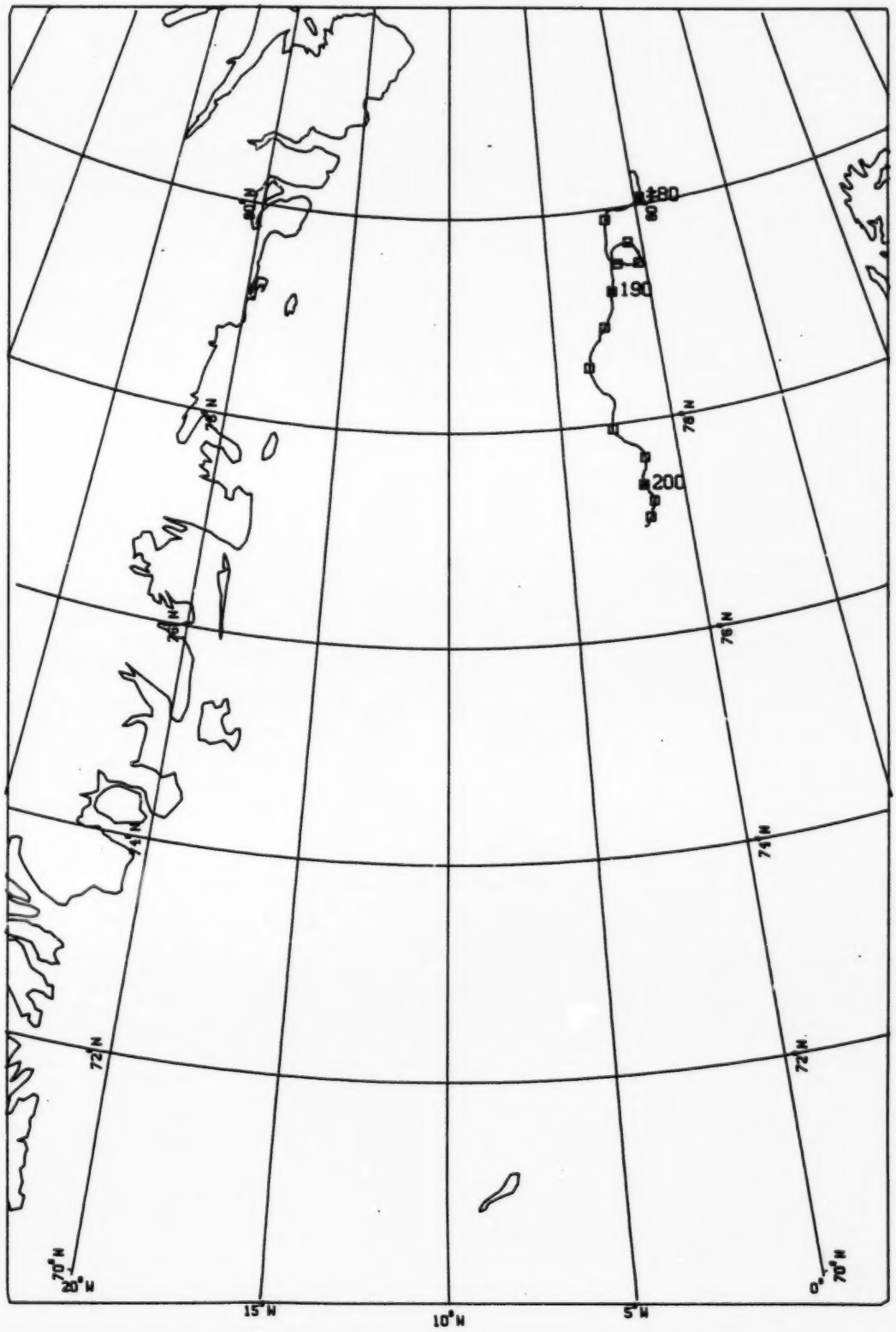
1984 - BUOY 2346



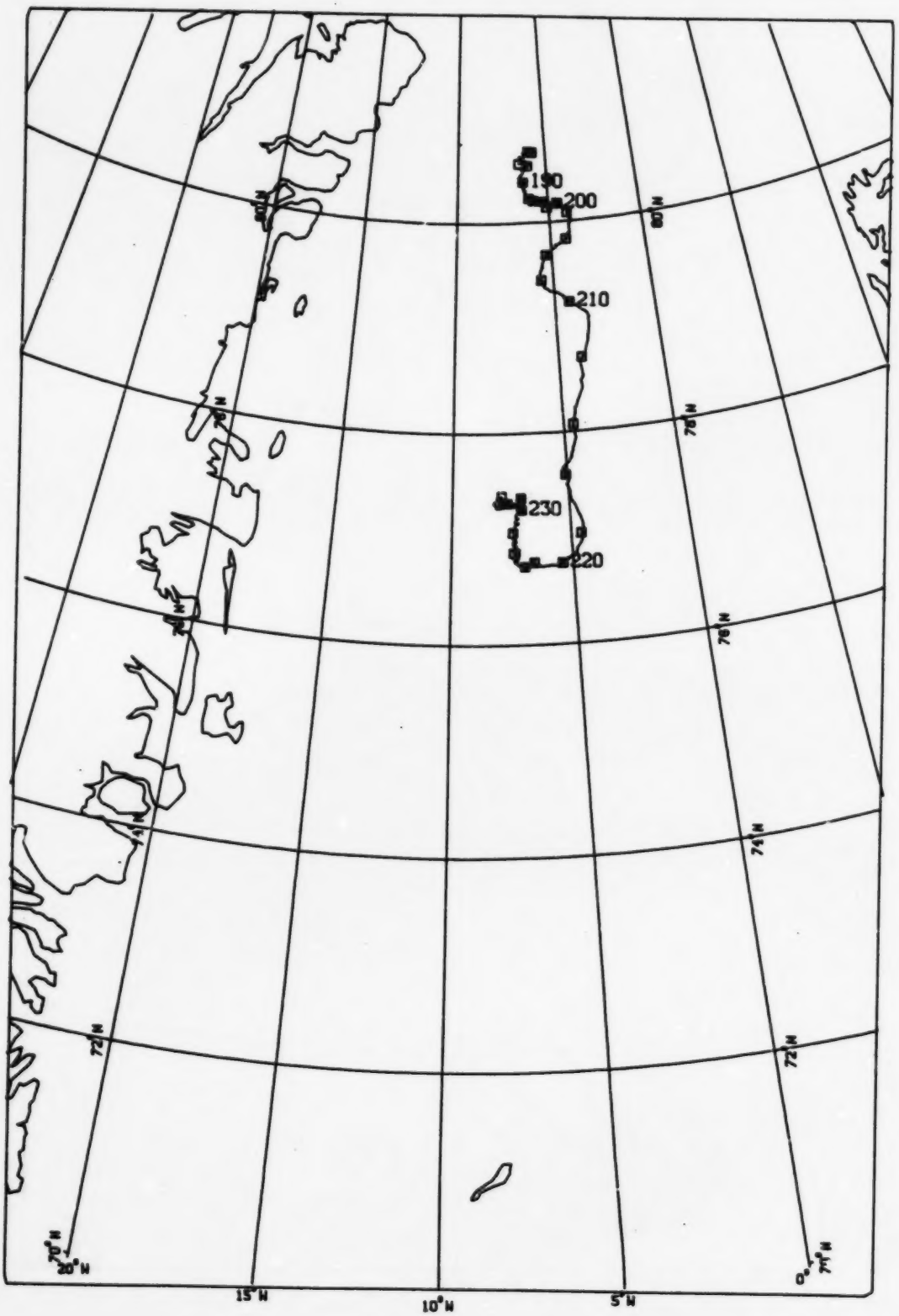
1984 - BUOY 2347



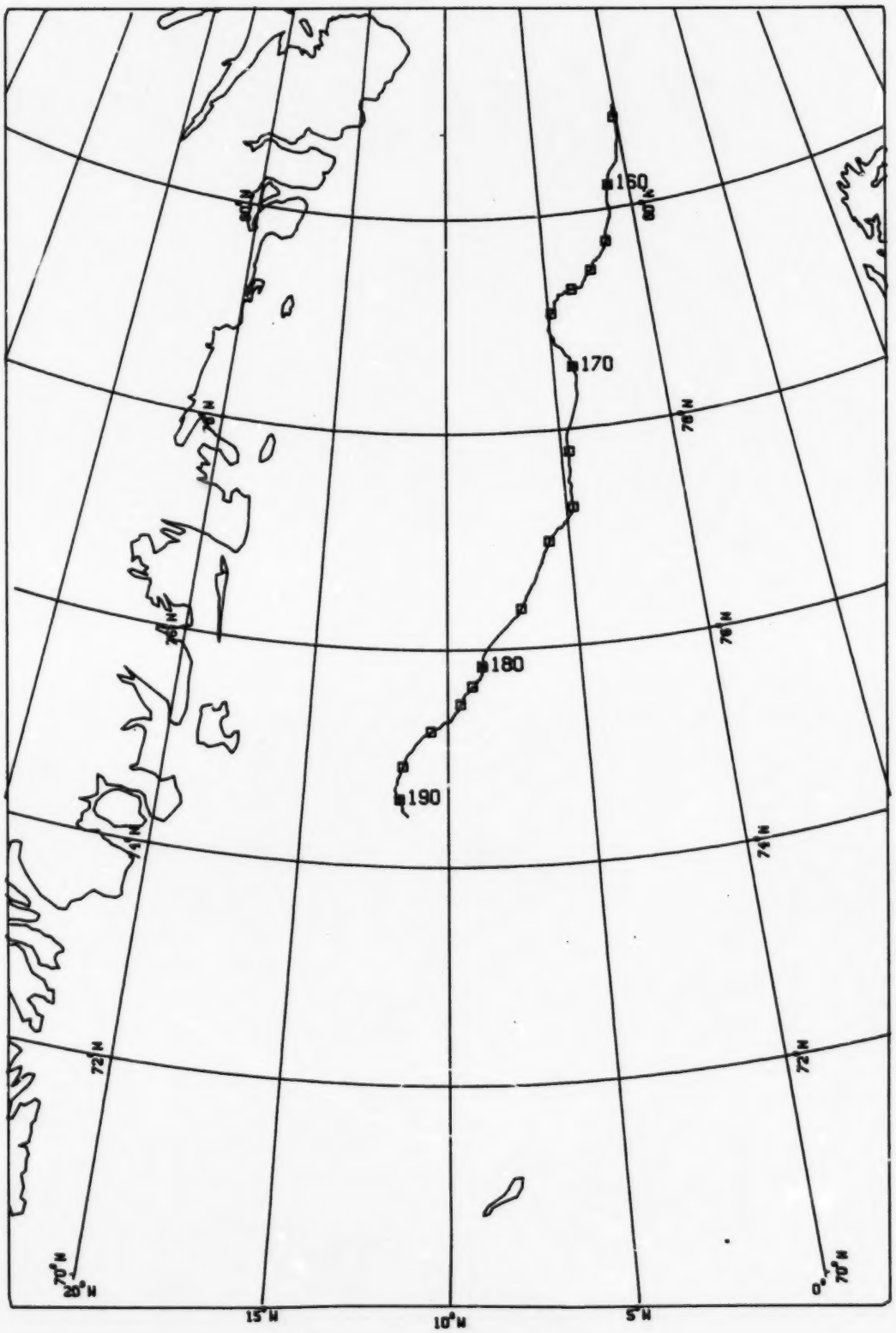
1984 - BUOY 2348



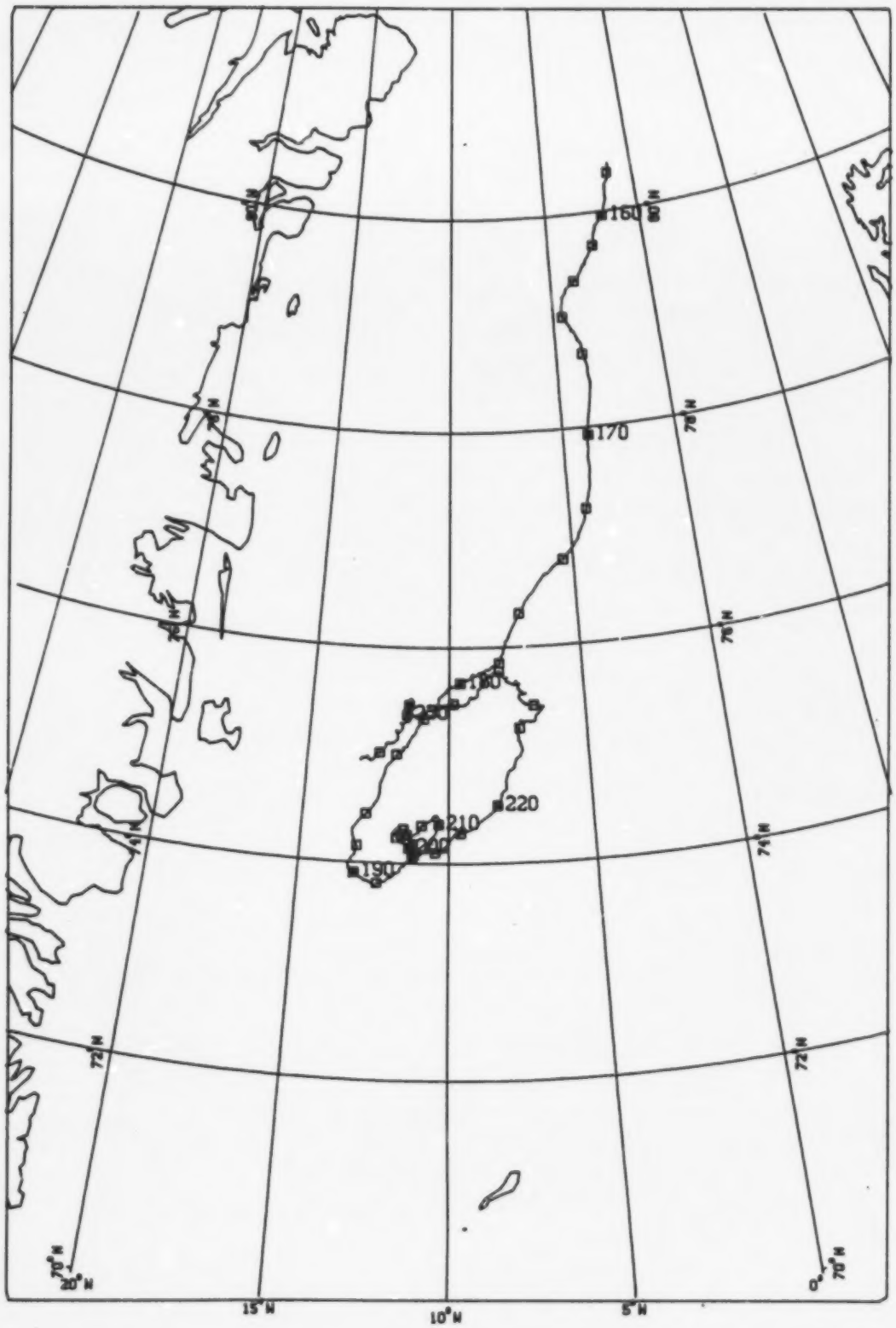
1984 - BUOY 2407



1984 - BUOY 2408



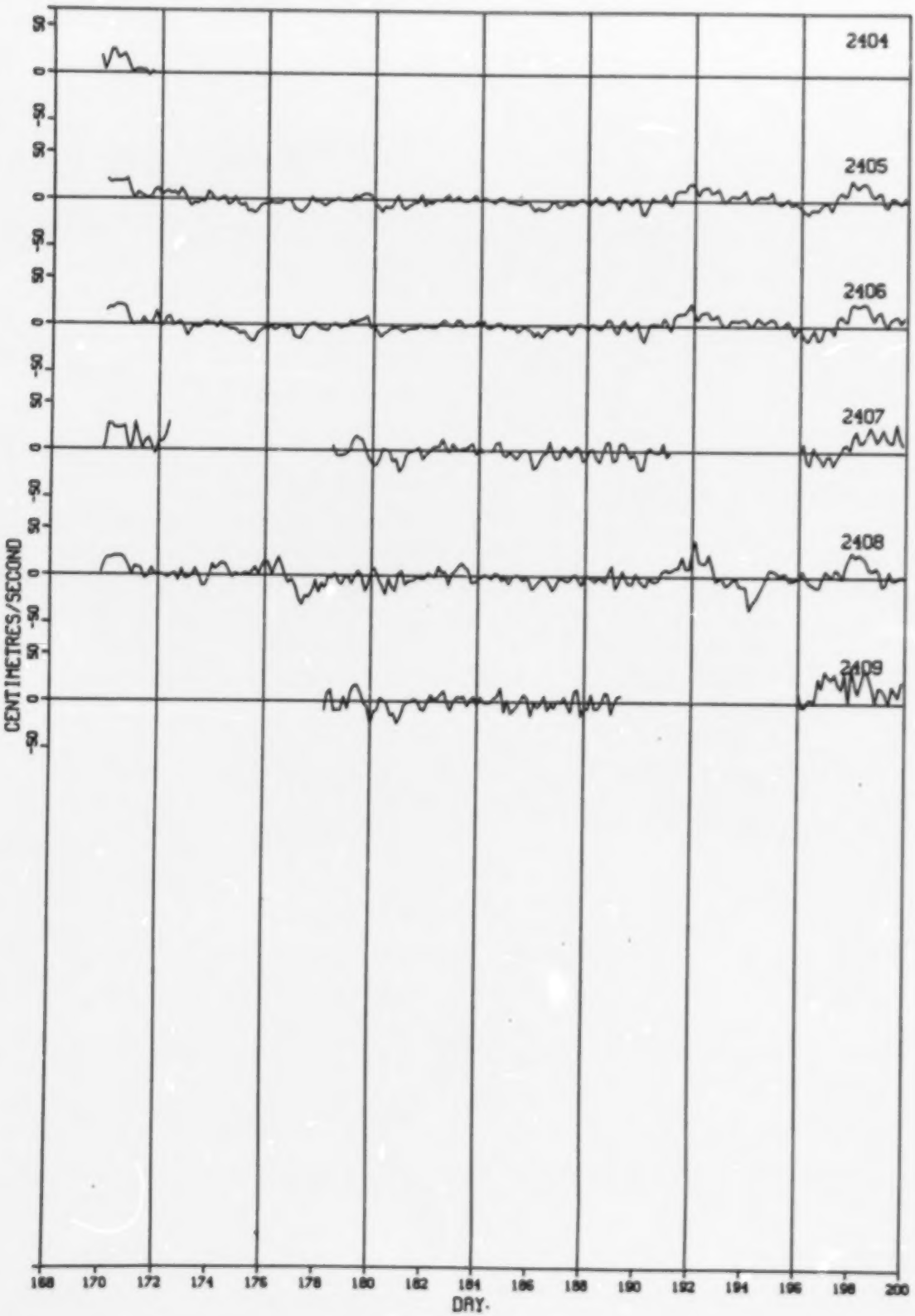
1984 - BUOY 2409



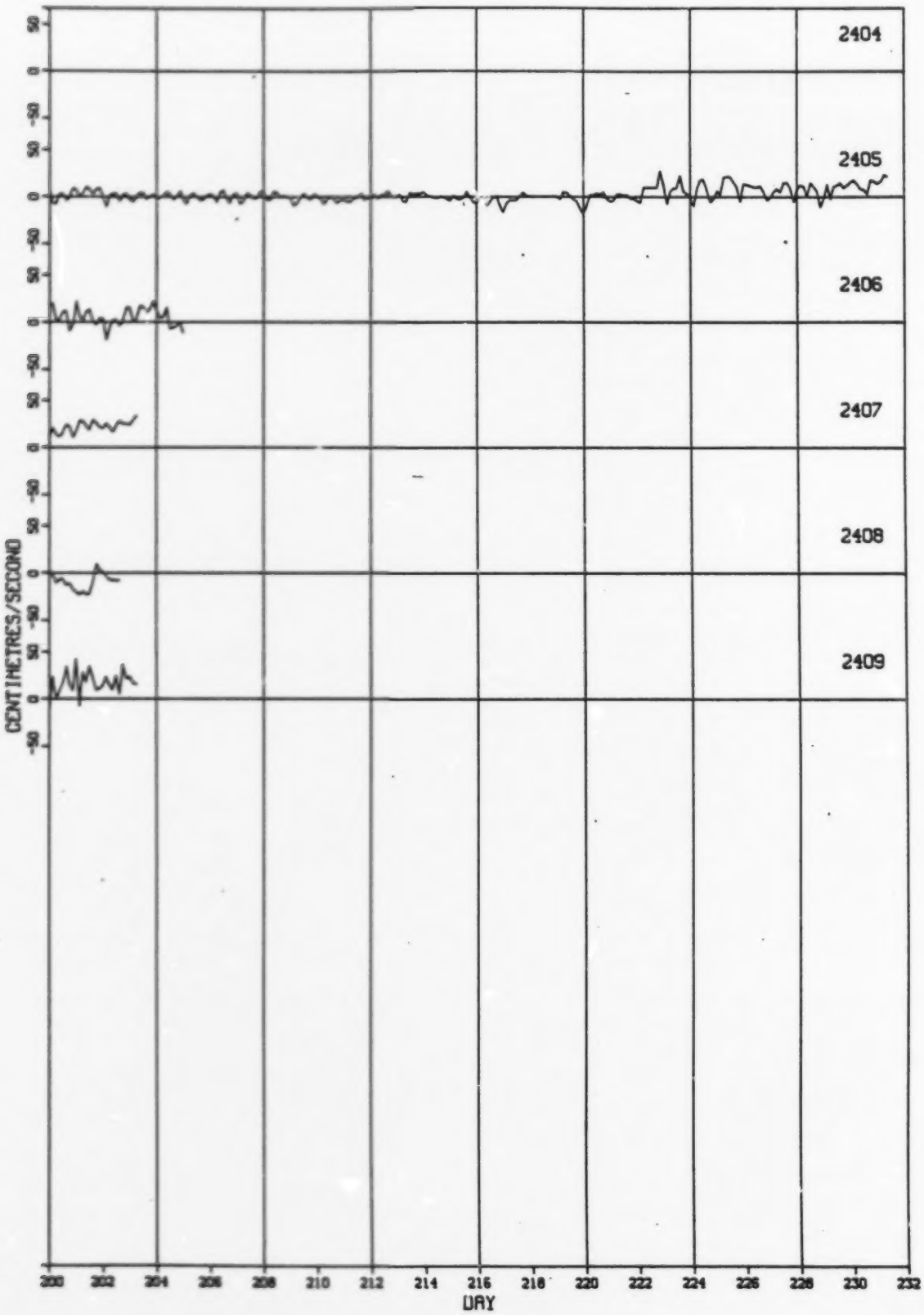
APPENDIX B

U,V TIME SERIES

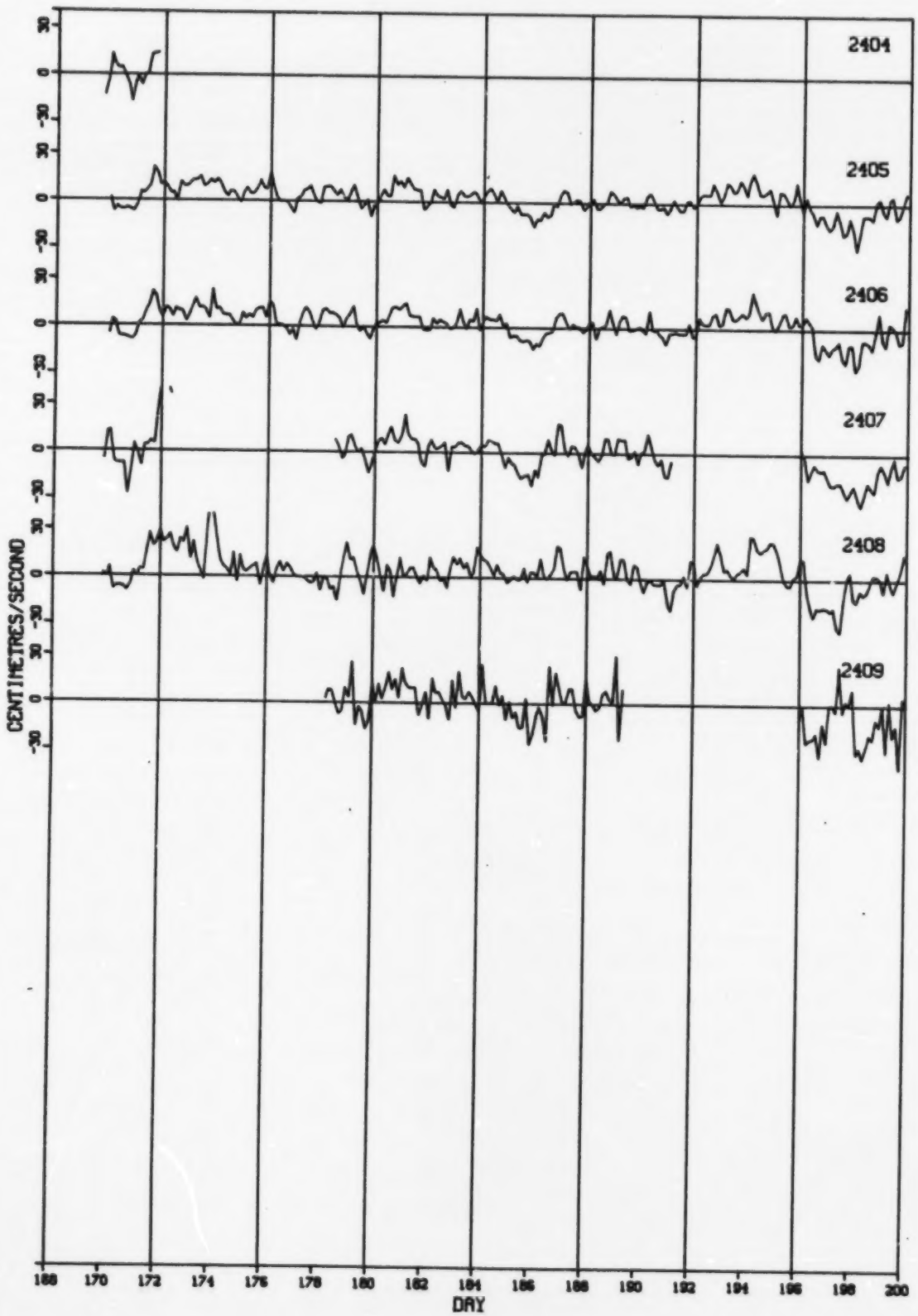
U COMPONENT - 1983



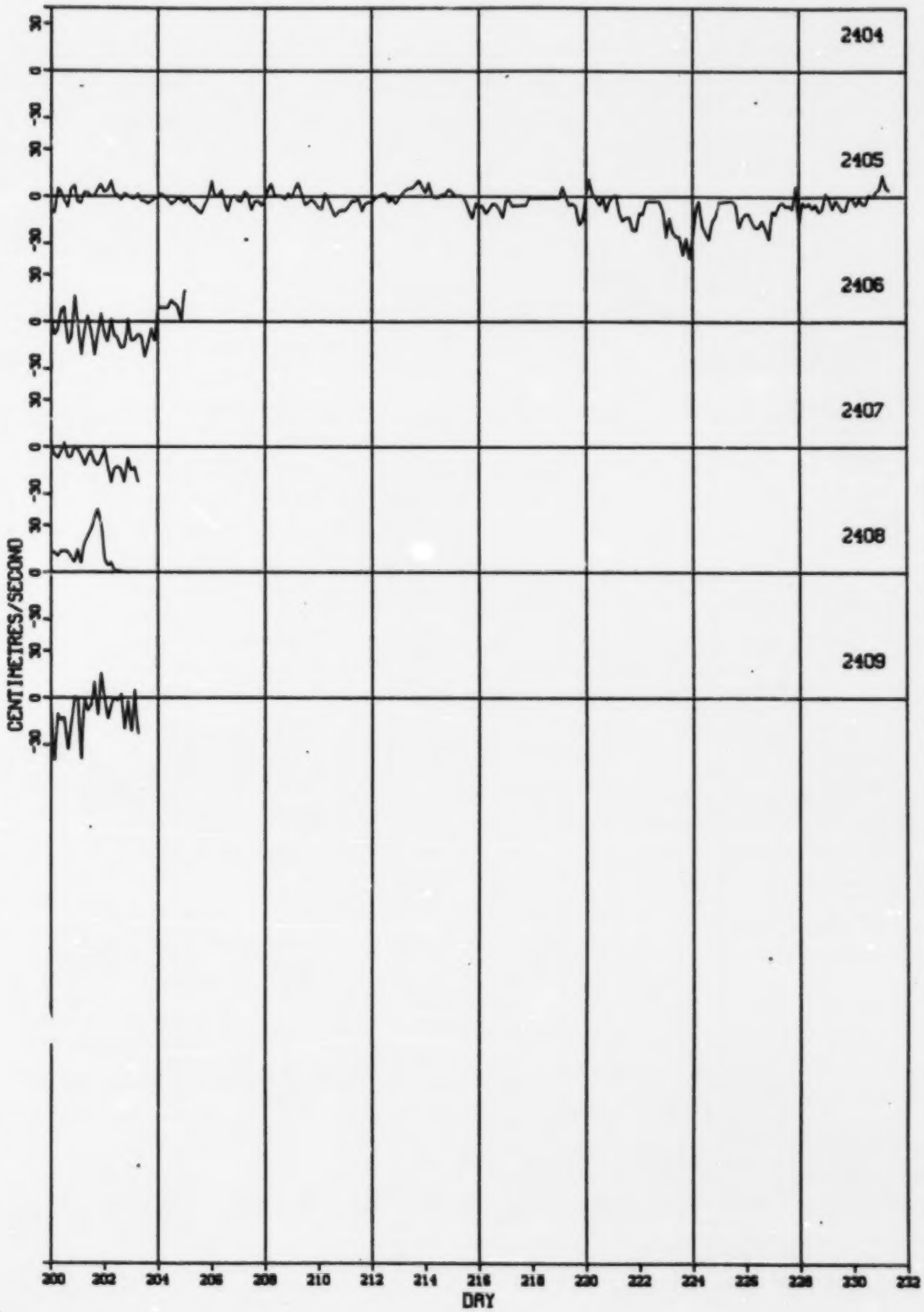
U COMPONENT - 1983



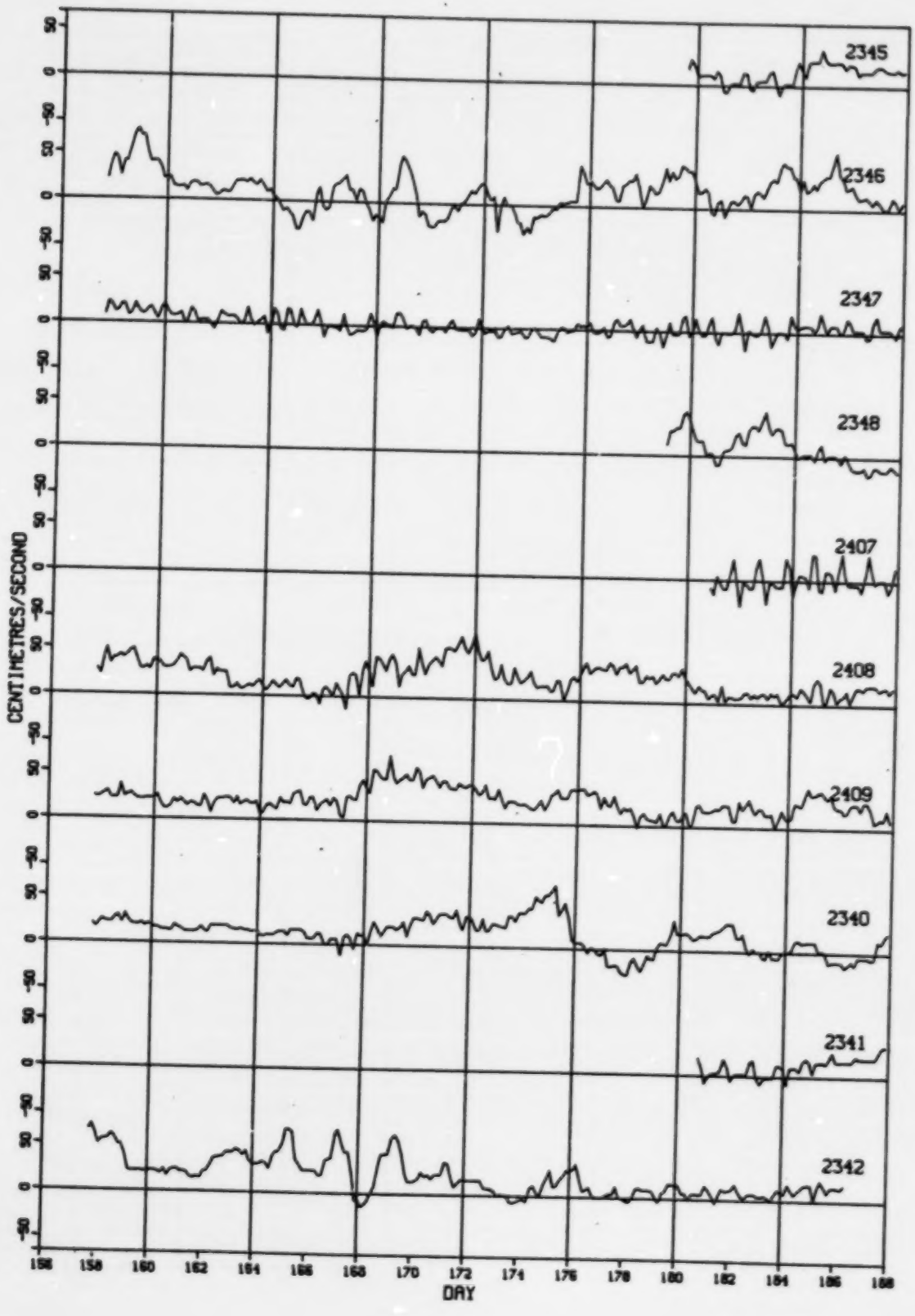
V COMPONENT - 1983



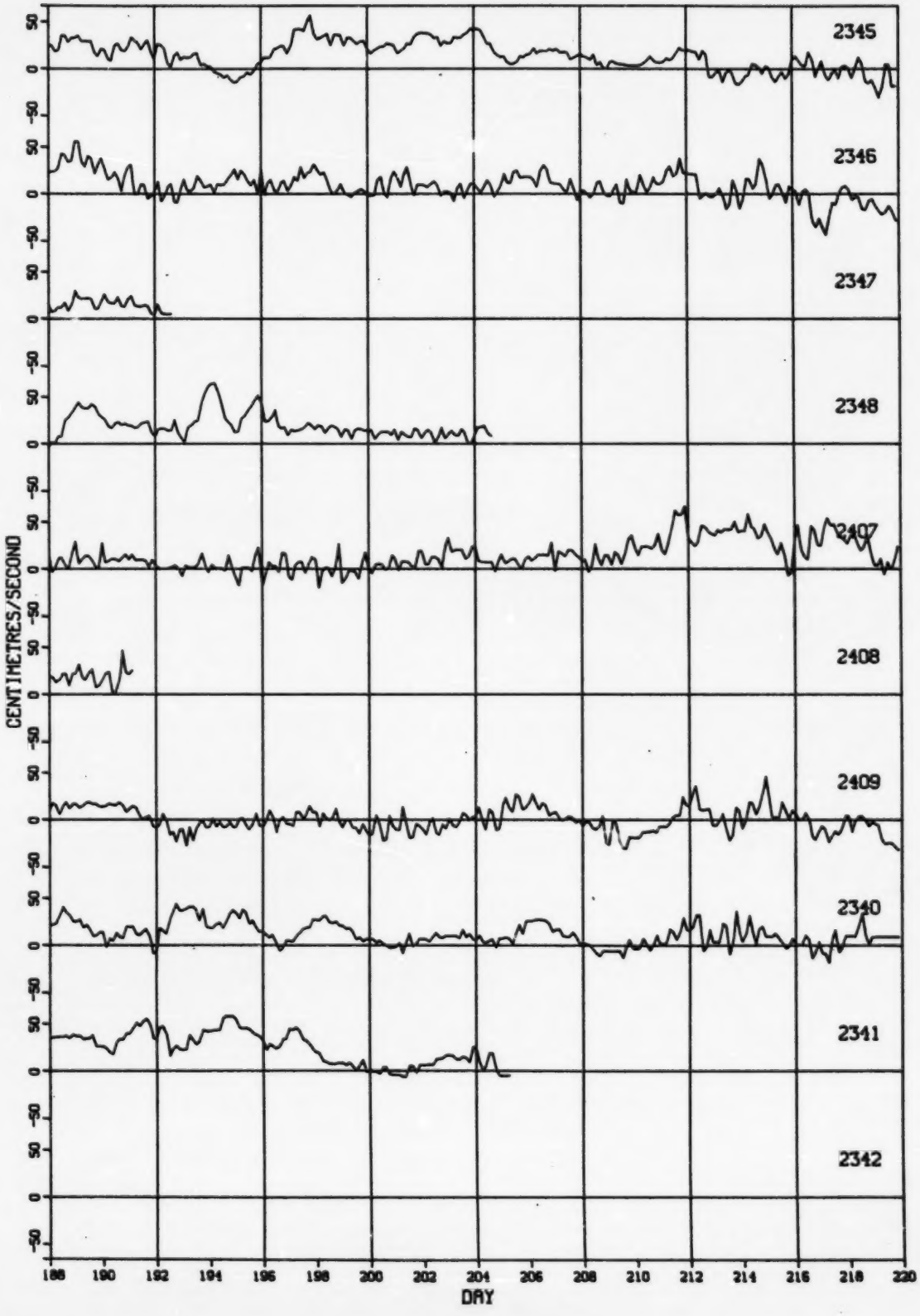
V COMPONENT - 1983



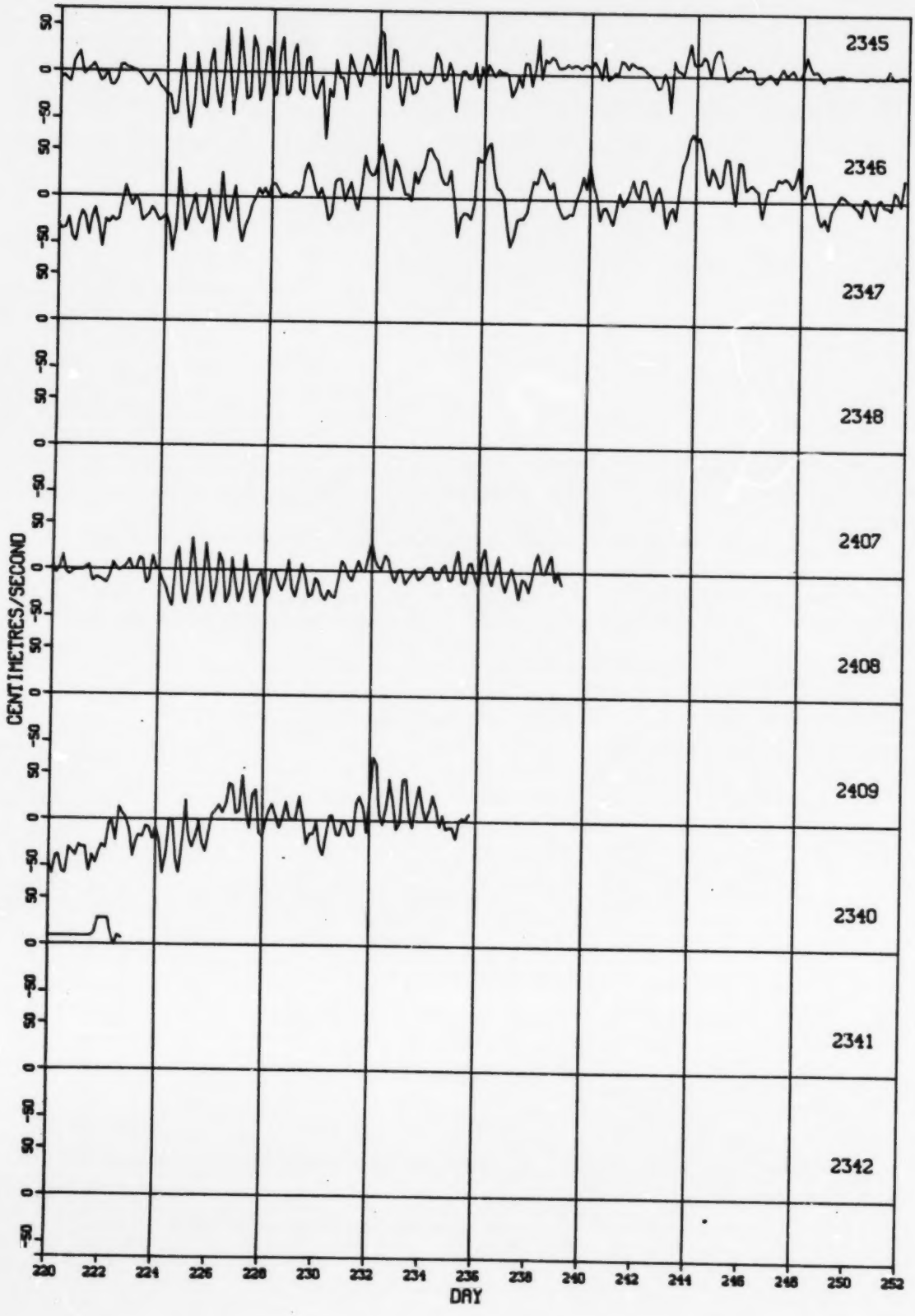
U COMPONENT - 1984



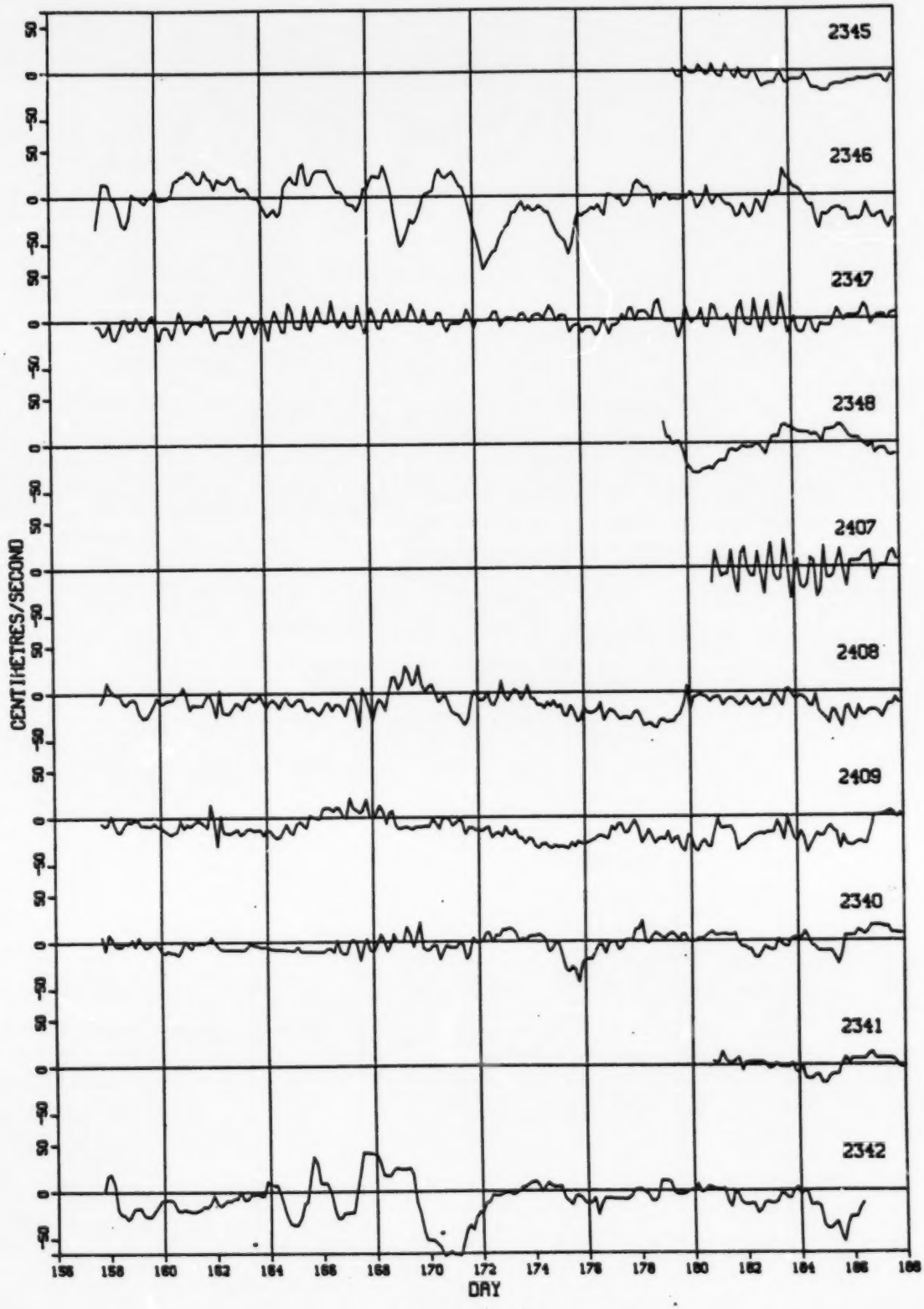
U COMPONENT - 1984



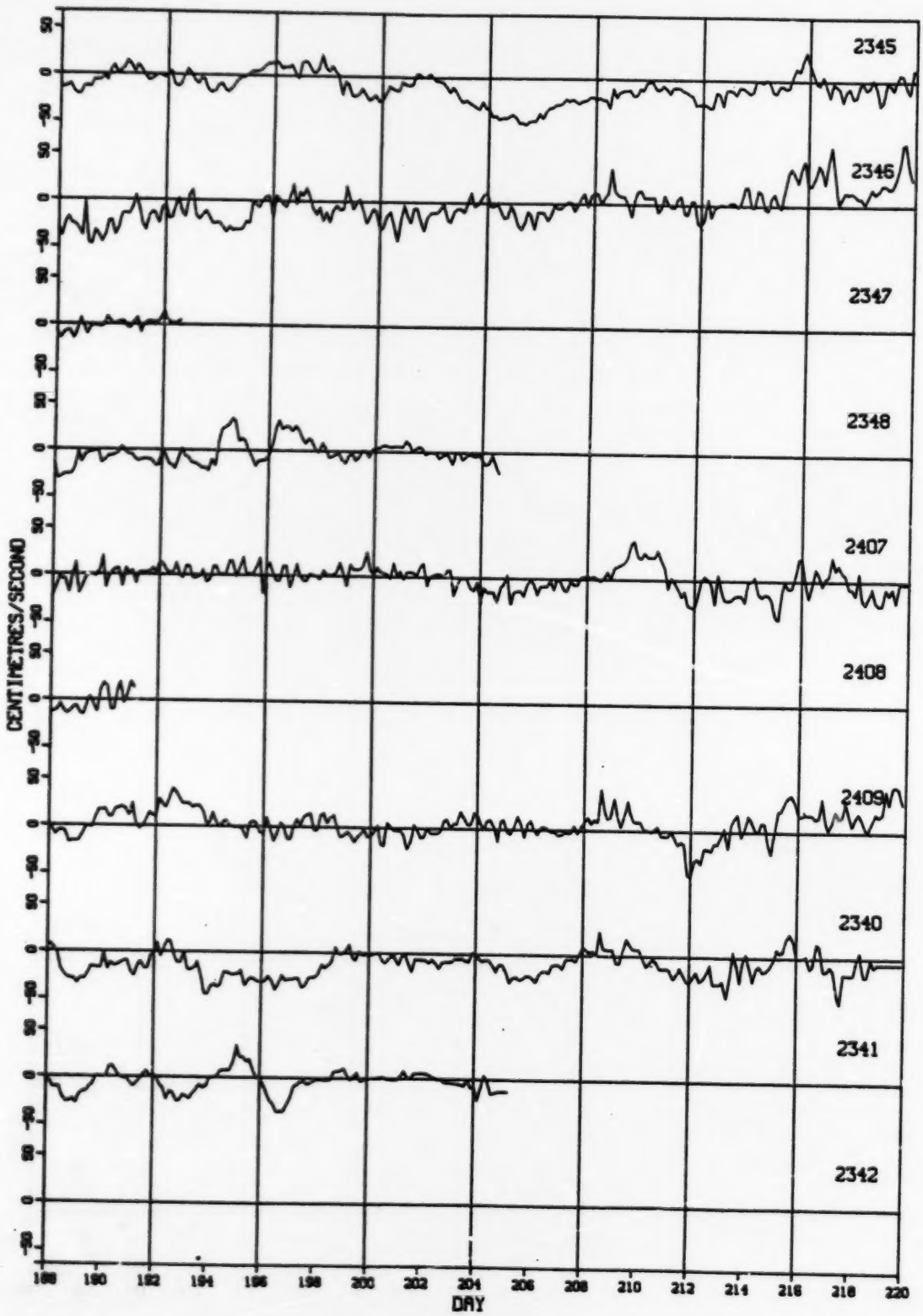
U COMPONENT - 1984



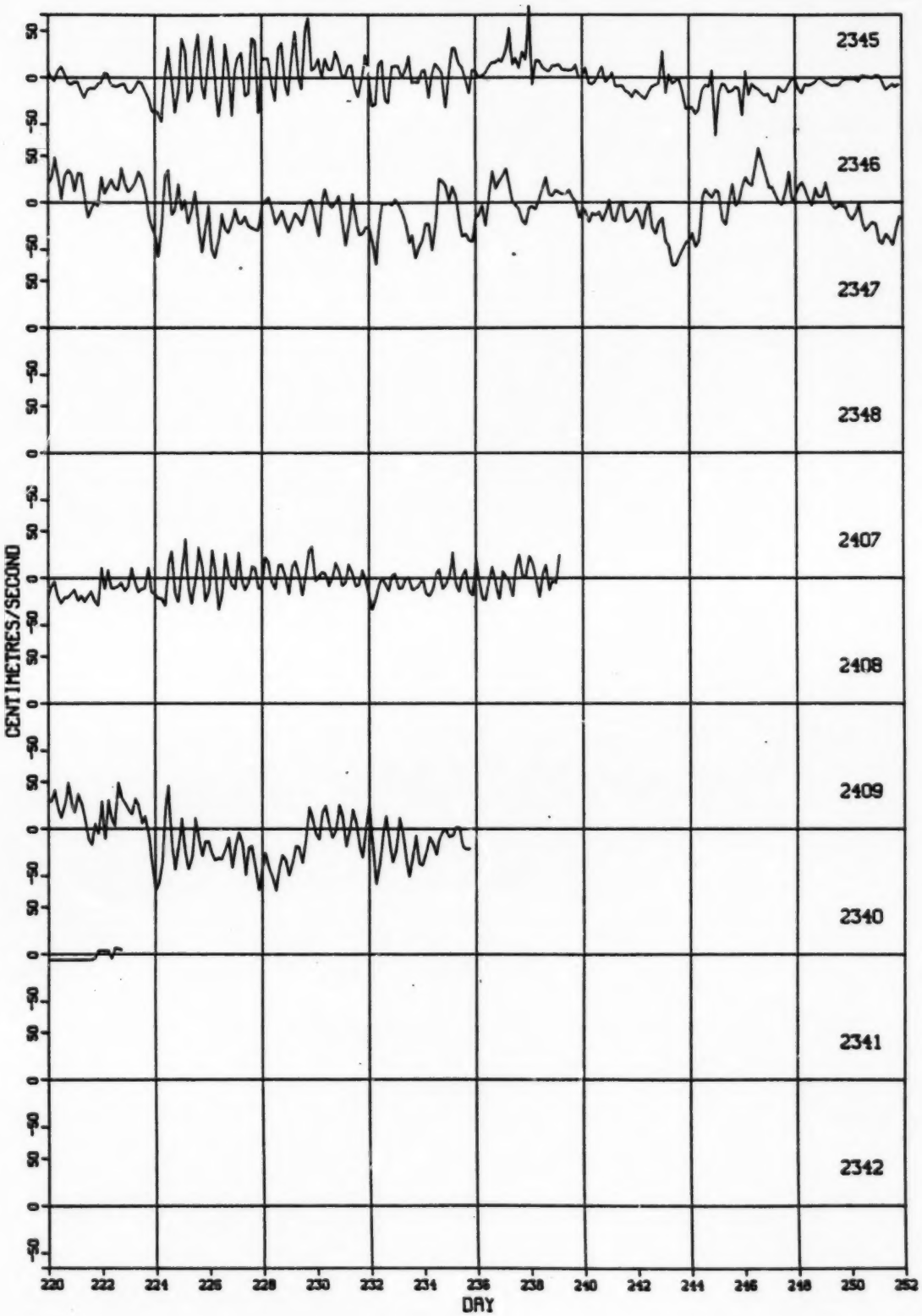
V COMPONENT - 1984



V COMPONENT - 1984



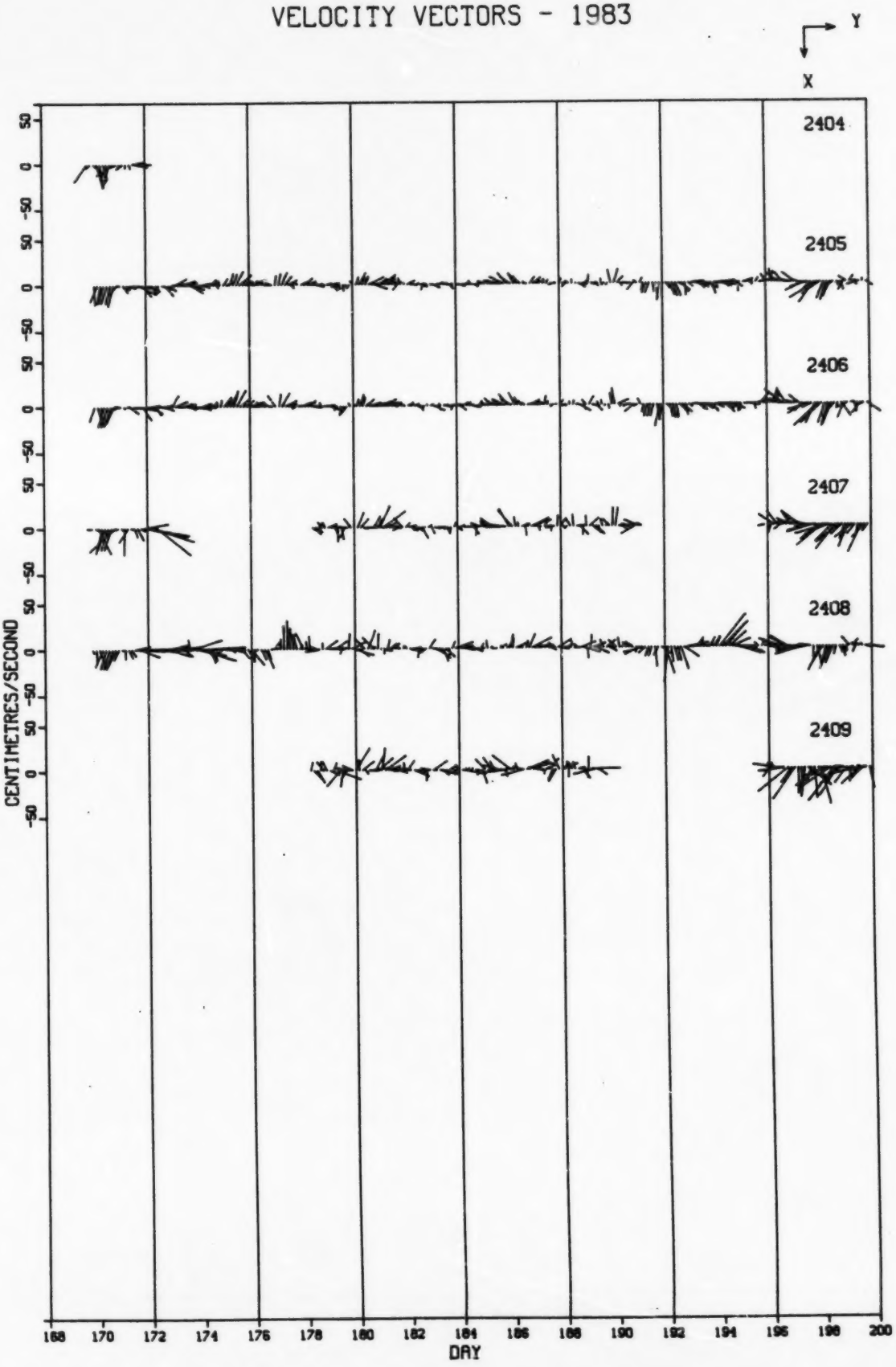
V COMPONENT - 1984



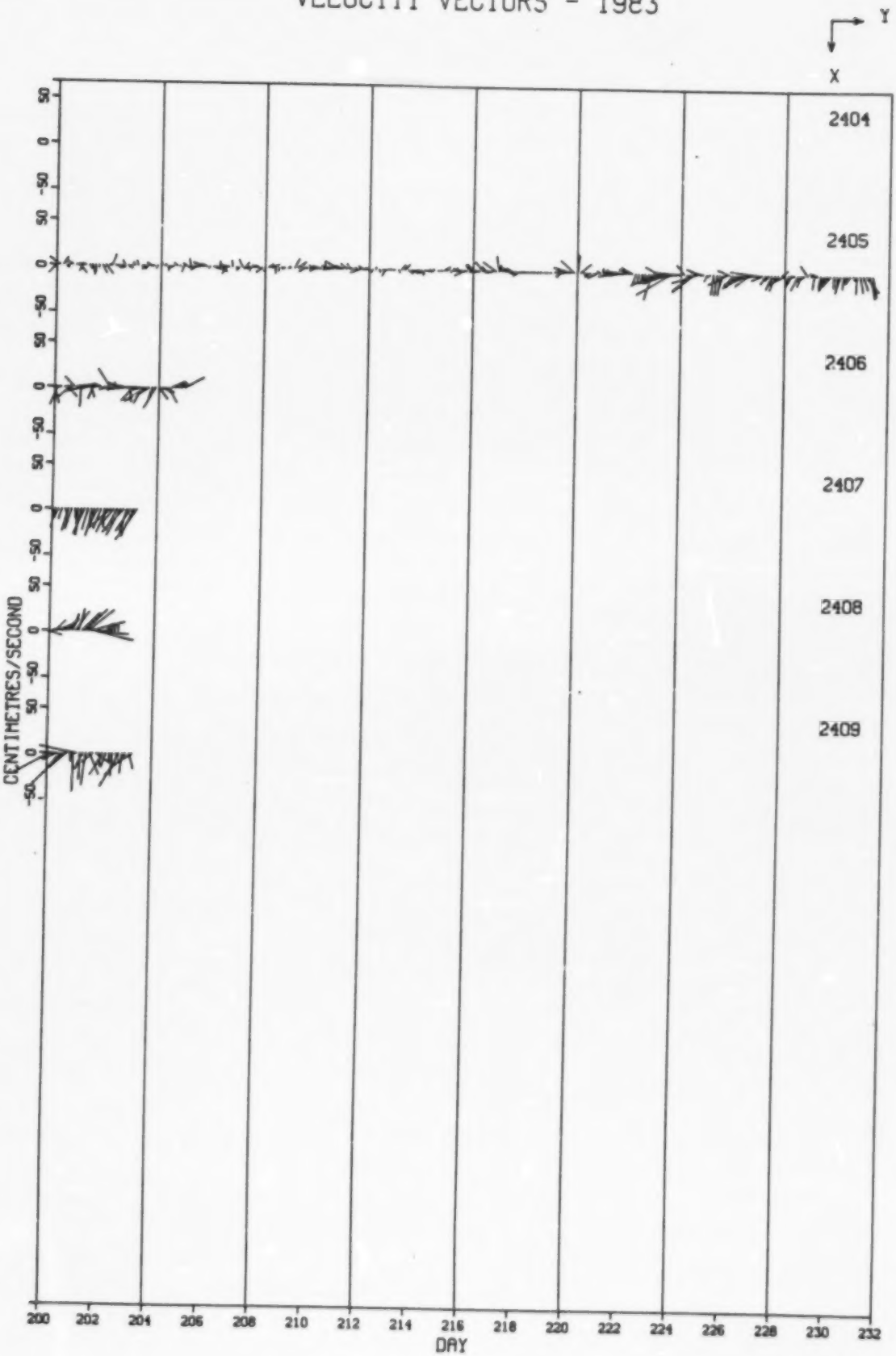
APPENDIX C

VECTOR TIME SERIES

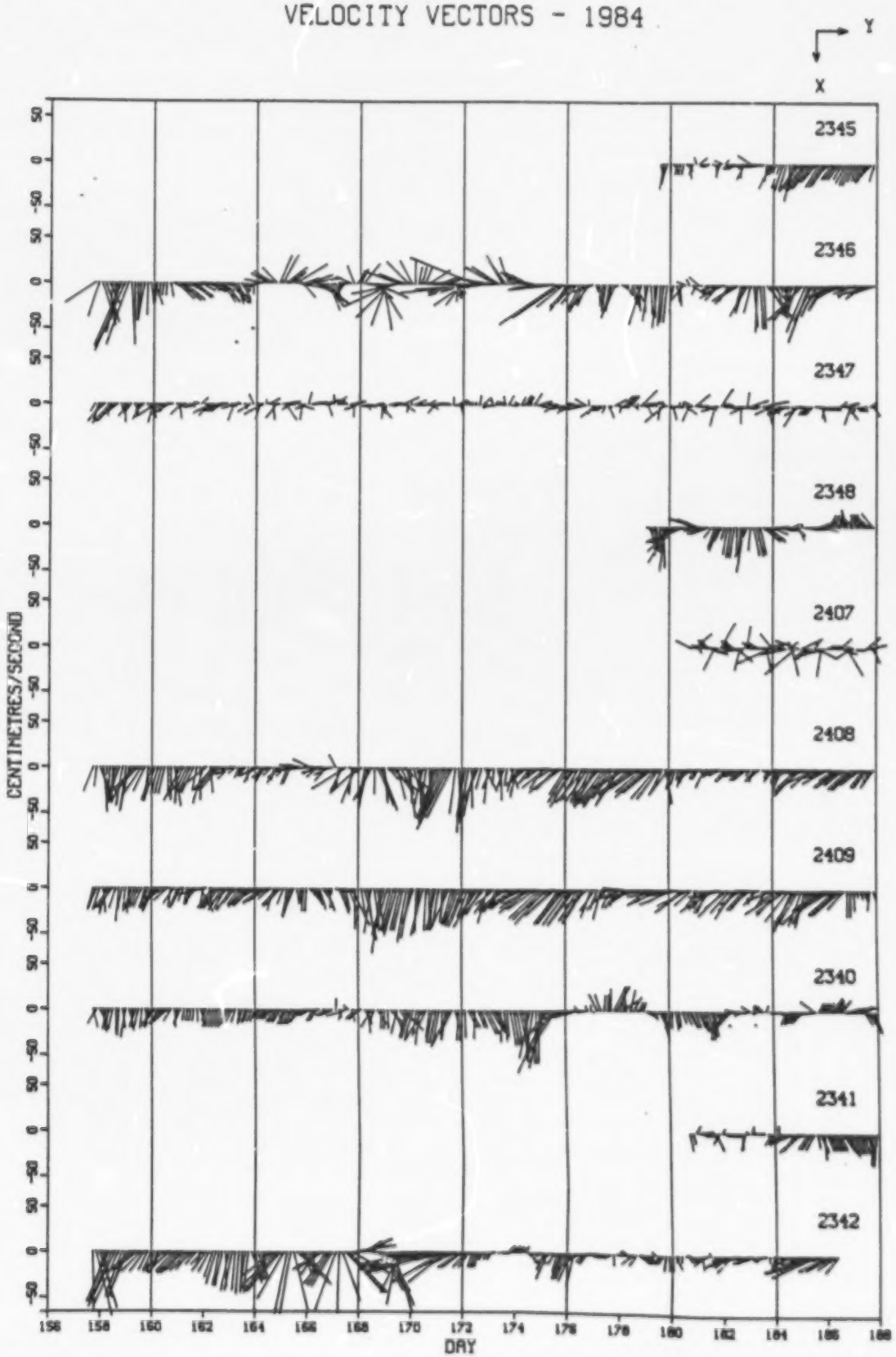
VELOCITY VECTORS - 1983



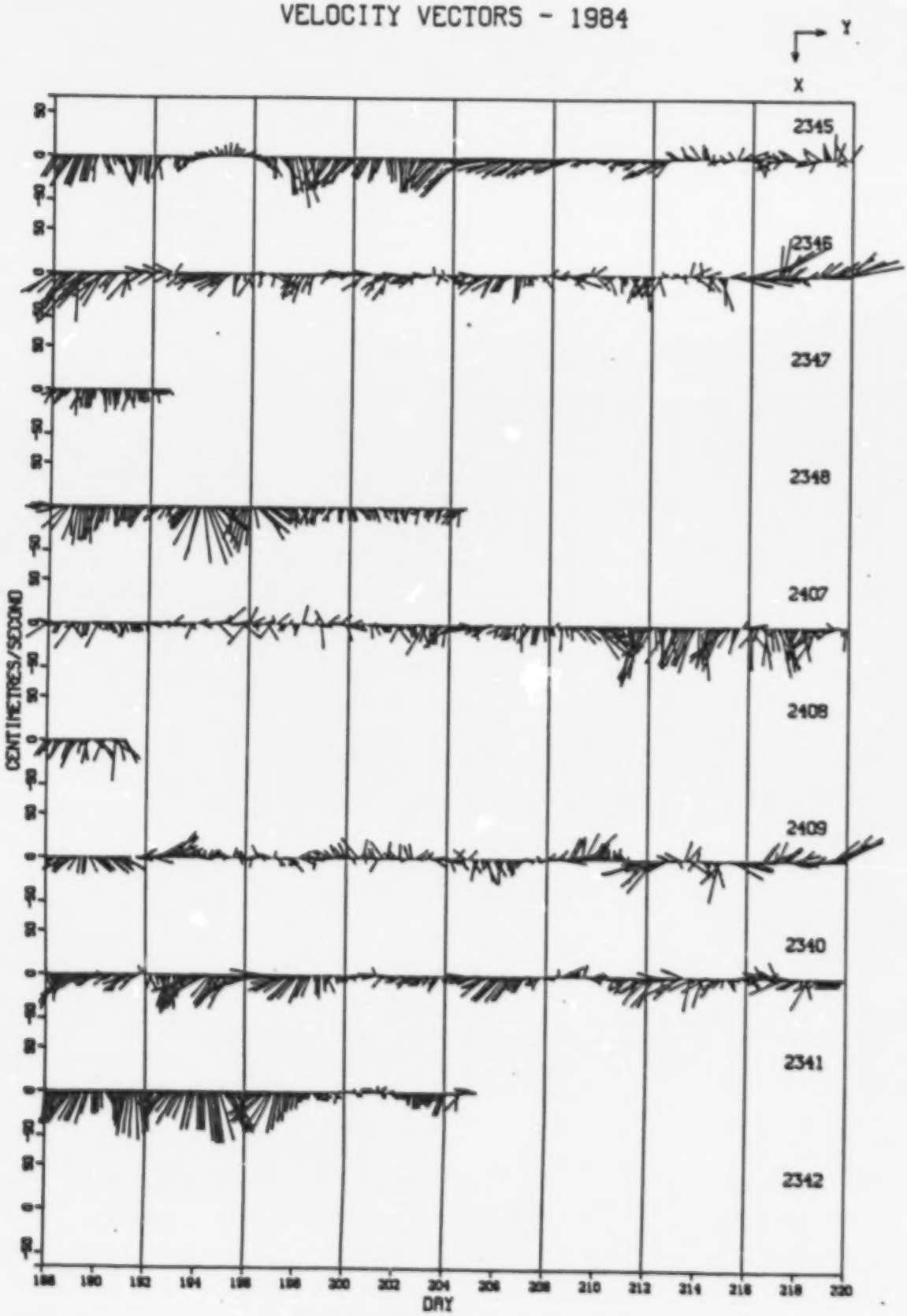
VELOCITY VECTORS - 1983



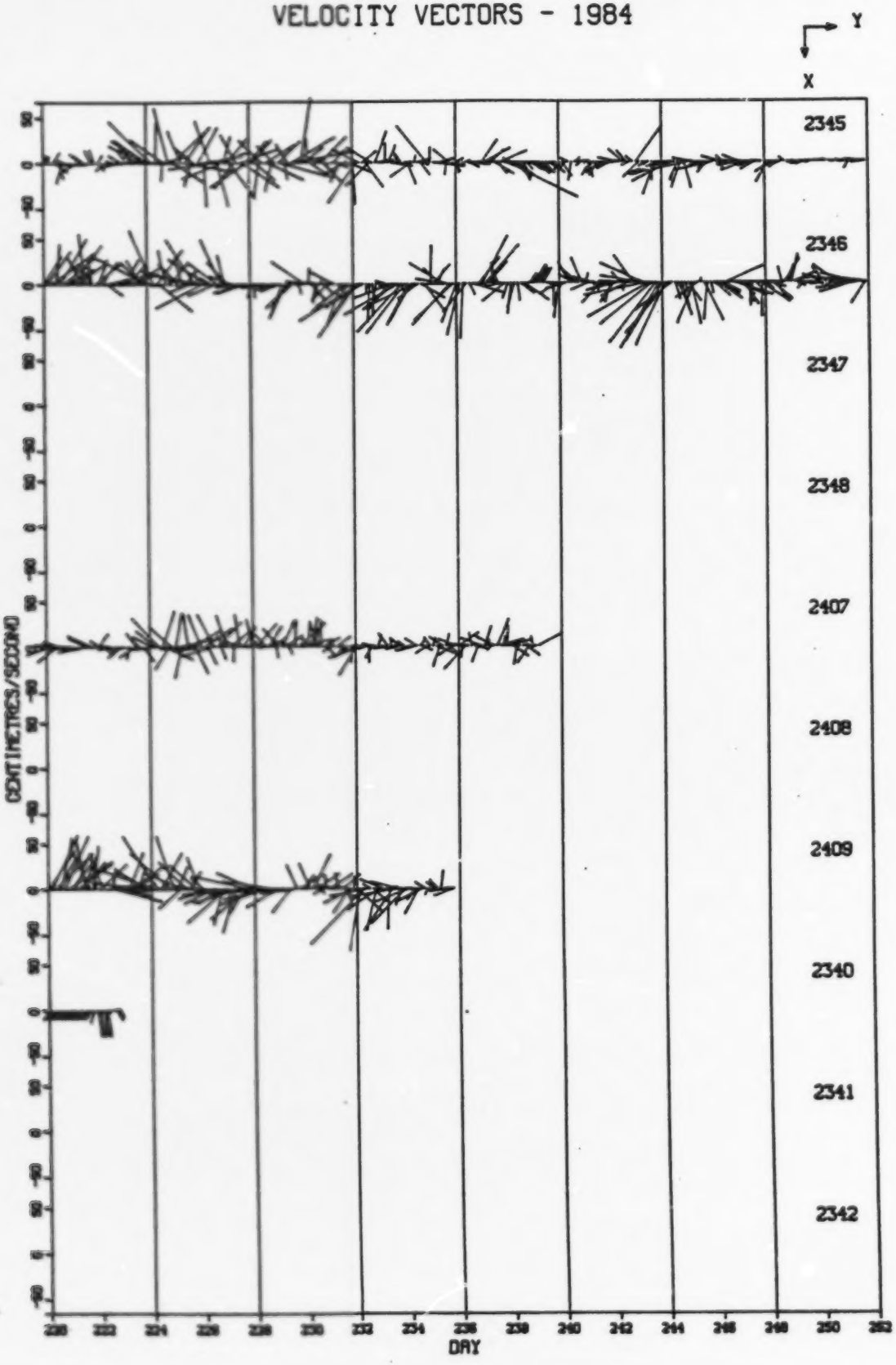
VELOCITY VECTORS - 1984



VELOCITY VECTORS - 1984



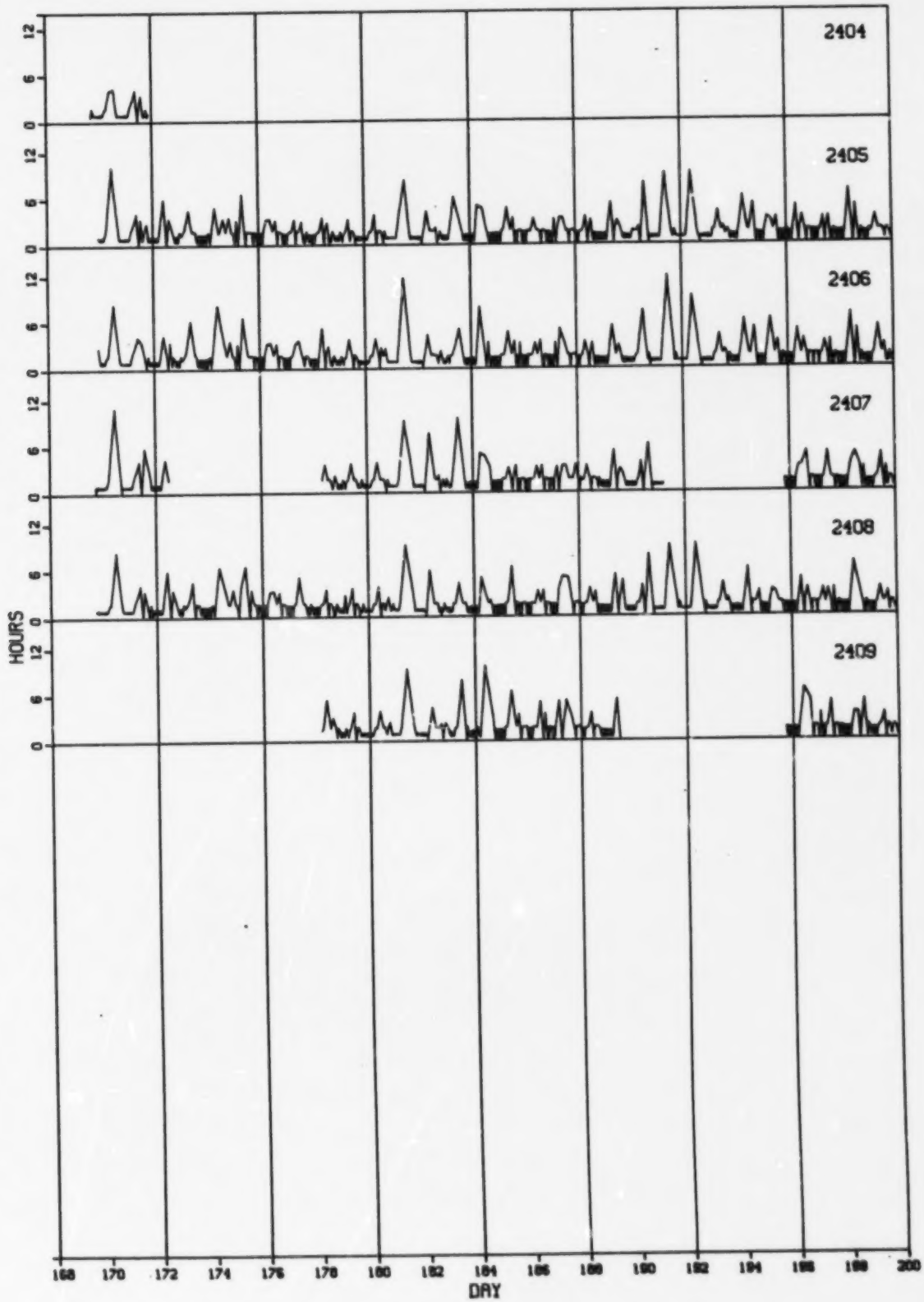
VELOCITY VECTORS - 1984



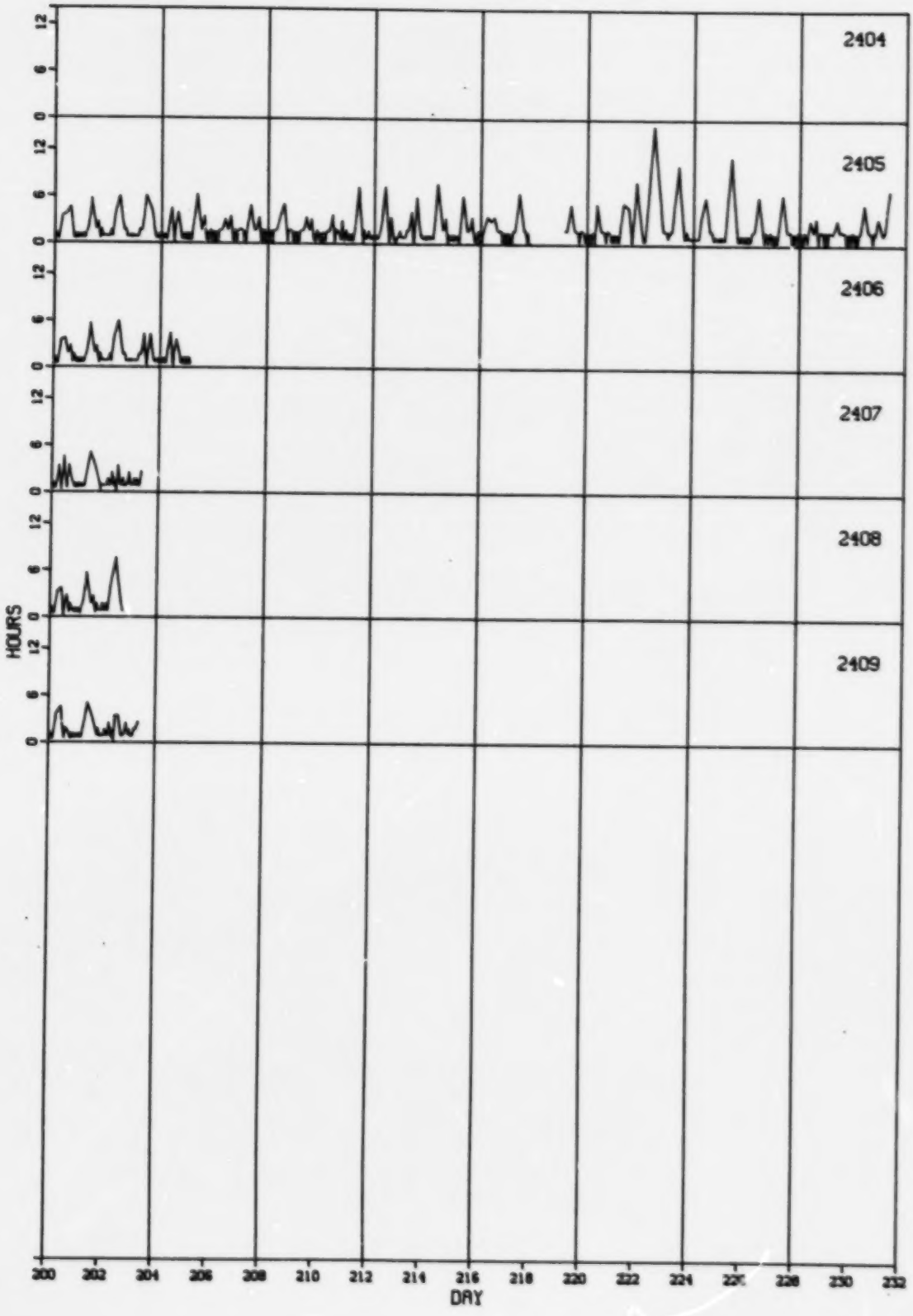
APPENDIX D

SAMPLING INTERVAL

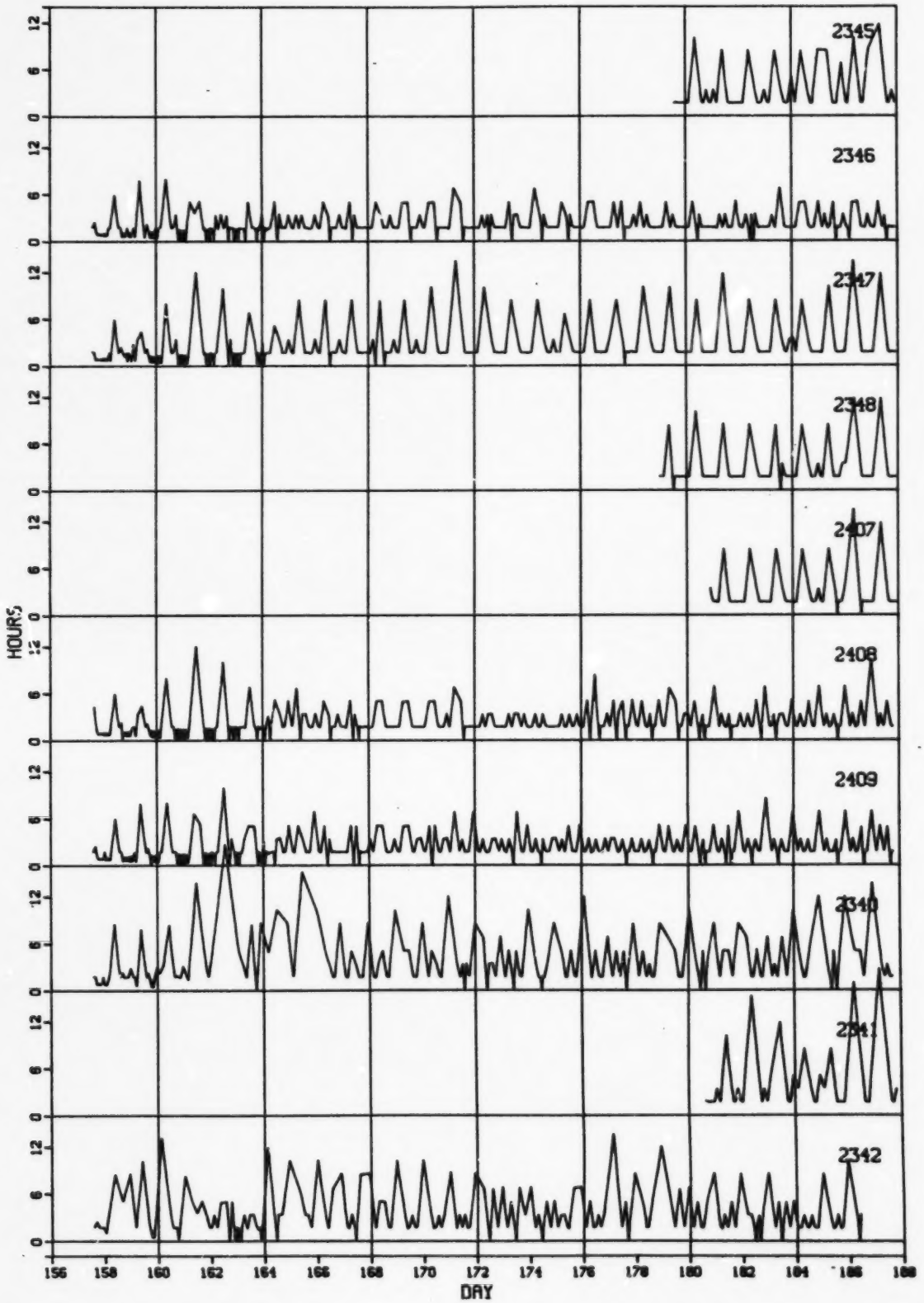
SAMPLING INTERVAL - 1983



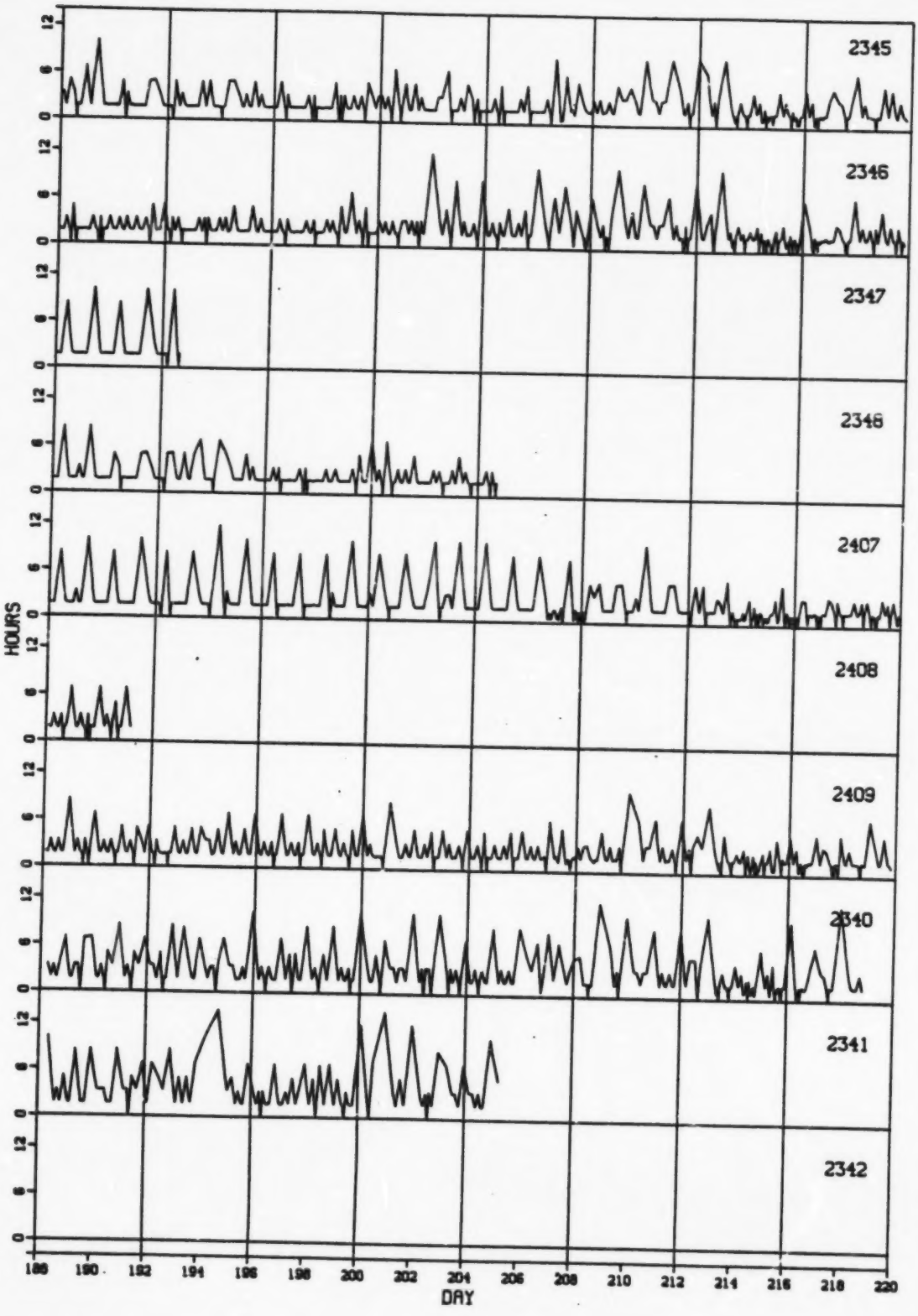
SAMPLING INTERVAL - 1983



SAMPLING INTERVAL - 1984



SAMPLING INTERVAL - 1984



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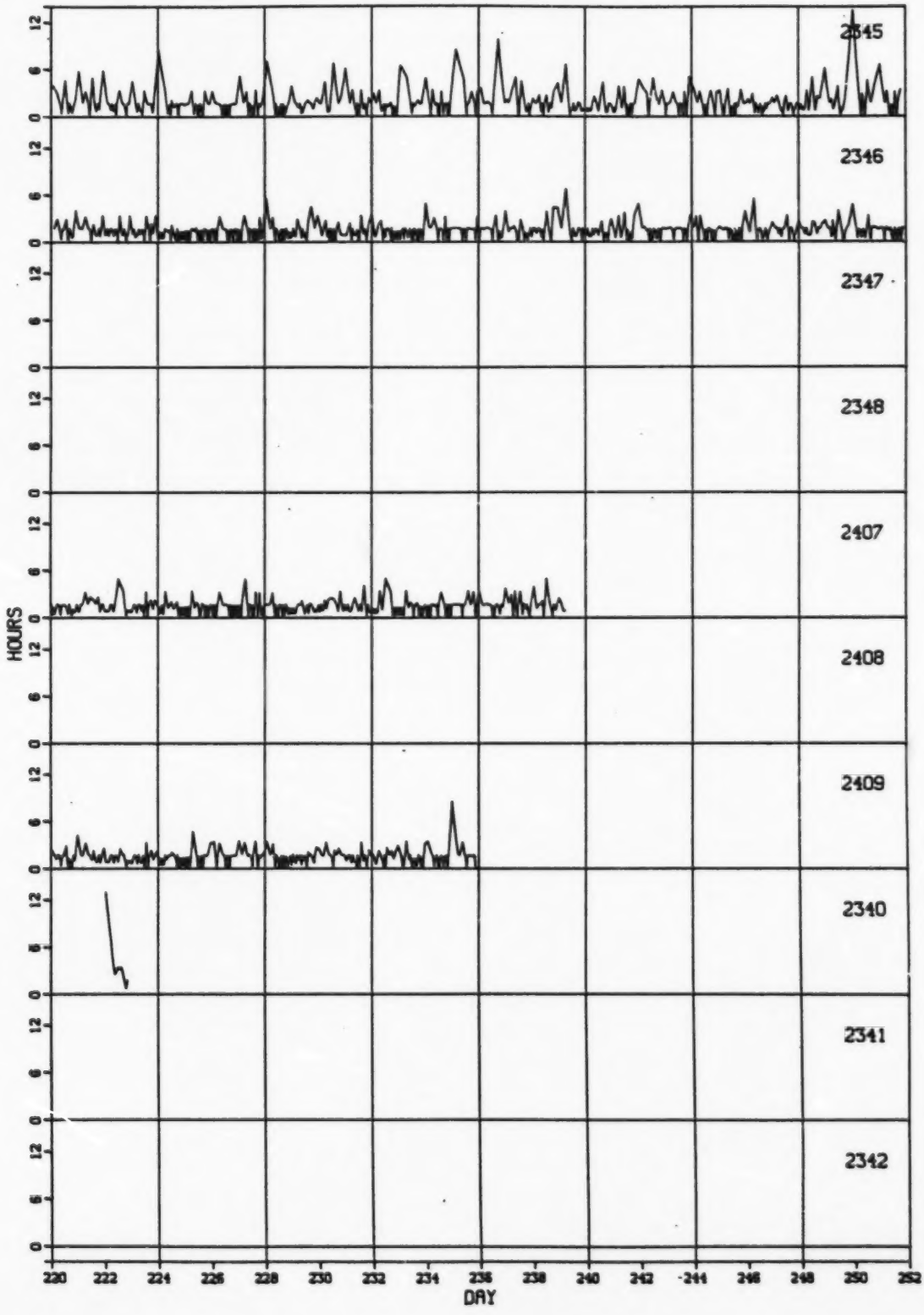

APPENDIX E

TABULATED DAILY POSITION AND VELOCITY

BUOY 2404 (1983)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
170	80.575	12.028		
171	80.522	11.766	7.753	-4.032

BUOY 2405 (1983)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
170	81.300	10.399		
171	81.227	10.280	9.582	-.617
172	81.163	10.781	6.301	11.221
173	81.141	11.308	.738	10.790
174	81.120	11.769	.830	9.522
175	81.164	12.056	-6.702	4.413
176	81.199	12.514	-6.288	7.897
177	81.251	12.652	-7.130	1.185
178	81.260	12.950	-2.428	5.449
179	81.249	13.106	.665	3.278
180	81.266	13.140	-2.258	.165
181	81.284	13.776	-5.114	11.570
182	81.290	13.914	-1.459	2.417
183	81.277	14.056	1.004	3.106
184	81.263	14.295	.589	4.975
185	81.278	14.229	-1.555	-1.740
186	81.353	13.822	-7.361	-9.994
187	81.379	13.974	-4.058	2.027
188	81.387	13.947	-.631	-.744
189	81.382	14.108	-.182	3.153
190	81.414	14.189	-4.320	.517
191	81.393	13.999	3.538	-2.876
192	81.284	13.944	13.853	2.339
193	81.214	14.284	7.075	8.648
194	81.156	14.821	4.563	12.153
195	81.129	15.011	2.380	4.543
196	81.179	15.129	-6.815	.593
197	81.221	14.622	-2.707	-11.067
198	81.131	13.665	15.835	-15.524
199	81.103	13.527	4.117	-1.831
200	81.103	13.417	.583	-2.124
201	81.073	13.374	3.876	.043
202	81.048	13.535	2.411	3.902
203	81.048	13.503	.194	-.621
204	81.043	13.416	.985	-1.566
205	81.050	13.234	-.089	-3.770
206	81.050	13.177	.266	-1.097
207	81.061	13.075	-.842	-2.299
208	81.054	13.027	1.106	-.747
209	81.065	13.130	-1.899	1.696
210	81.083	12.931	-1.351	-4.402
211	81.122	12.597	-3.439	-7.619
212	81.125	12.462	.238	-2.684
213	81.123	12.477	.190	.335
214	81.100	12.684	2.014	4.683
215	81.109	12.755	-1.516	1.108
216	81.144	12.378	-2.745	-8.303
217	81.198	12.125	-5.661	-6.354
218	81.195	11.982	.897	-2.684
219	81.187	11.917	1.285	-1.051
220	81.238	11.781	-5.886	-3.961
221	81.243	11.464	.626	-6.234
222	81.250	10.851	1.535	-11.947
223	81.196	10.006	9.797	-15.105
224	81.168	8.753	7.577	-23.849
225	81.110	8.164	9.057	-10.465
226	81.041	7.407	10.834	-13.804
227	81.015	6.709	5.092	-13.514
228	80.955	6.366	8.388	-5.599
229	80.915	6.097	5.738	-5.285
230	80.818	5.802	12.996	-4.712
231	80.690	5.919	16.136	4.078

BUOY 2406 (1983)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
170	80.947	8.978		
171	80.891	8.828	7.556	-1.916
172	80.846	9.382	3.919	12.115
173	80.856	9.917	-3.070	10.604
174	80.840	10.426	.117	10.632
175	80.907	10.731	-9.610	4.555
176	80.938	11.201	-5.688	8.642
177	80.990	11.322	-6.981	1.103
178	80.994	11.659	-1.879	6.560
179	80.979	11.837	1.109	3.895
180	80.997	11.883	-2.419	.453
181	81.011	12.468	-4.222	11.156
182	81.022	12.612	-2.103	2.493
183	81.005	12.732	1.676	2.850
184	80.995	12.982	.105	5.212
185	81.012	12.908	-1.803	-1.962
186	81.077	12.548	-6.609	-8.899
187	81.101	12.775	-3.940	3.766
188	81.106	12.765	-.600	-.332
189	81.094	12.978	.514	4.473
190	81.125	13.047	-4.103	.457
191	81.097	12.790	4.580	-4.201
192	80.982	12.645	15.111	.420
193	80.919	12.954	6.487	7.911
194	80.852	13.465	6.008	12.124
195	80.811	13.736	3.789	6.651
196	80.854	13.974	-6.499	3.437
197	80.904	13.360	-3.251	-13.717
198	80.788	12.429	18.685	-15.308
199	80.715	12.207	10.126	-2.493
200	80.642	12.124	9.623	.301
201	80.593	11.898	7.073	-3.367
202	80.615	11.521	-1.164	-8.347
203	80.571	10.919	8.073	-11.339
204	80.485	10.802	11.262	-.364

BUOY 2407 (1983)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
170	80.485	11.498		
171	80.385	11.053	14.461	-6.840
172	80.256	12.236	11.026	28.472
178	80.846	8.638		
179	80.828	8.782	1.759	3.246
180	80.860	8.822	-4.097	.196
181	80.913	9.478	-8.868	12.153
182	80.914	9.557	-.408	1.557
183	80.885	9.678	3.295	3.074
184	80.870	9.862	1.203	4.026
185	80.887	9.617	-1.313	-5.316
186	80.956	9.145	-7.165	-10.924
187	80.961	9.479	-1.682	6.596
188	80.985	9.435	-2.899	-1.399
189	80.965	9.706	1.642	5.844
190	81.013	9.826	-6.602	1.354
196	79.165	-.381		
197	79.217	-.993	-6.864	-14.745
198	79.124	-2.034	11.311	-25.560
199	78.982	-2.577	17.736	-14.055
200	78.858	-2.779	15.574	-5.744
201	78.687	-2.928	21.822	-4.854
202	78.503	-3.309	23.094	-11.011

BUOY 2408 (1983)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
170	80.756	12.799		
171	80.676	12.643	10.776	-.902
172	80.631	13.807	-.007	25.047
173	80.590	14.646	.784	18.411
174	80.523	15.572	3.132	21.138
175	80.498	15.794	1.640	5.436
176	80.419	15.860	9.424	4.119
177	80.483	16.102	-9.385	2.710
178	80.578	16.091	-11.676	-3.616
179	80.591	16.391	-3.269	5.638
180	80.612	16.631	-4.029	4.079
181	80.653	16.838	-6.324	2.643
182	80.654	16.972	-.965	2.648
183	80.604	17.146	5.139	5.404
184	80.590	17.599	-1.178	9.633
185	80.595	17.682	-1.186	1.442
186	80.629	17.892	-5.479	2.896
187	80.656	18.359	-6.400	8.210
188	80.666	18.565	-2.467	3.706
189	80.648	18.944	-.476	8.220
190	80.686	19.005	-5.009	-.355
191	80.678	18.623	3.626	-7.212
192	80.530	18.456	19.100	2.702
193	80.491	18.892	1.771	10.390
194	80.574	19.708	-15.730	12.850
195	80.522	20.381	1.355	15.669
196	80.534	20.353	-1.216	-1.093
197	80.595	19.373	-.430	-22.189
198	80.487	18.693	17.877	-9.095
199	80.459	18.586	4.148	-.992
200	80.451	19.038	-2.163	9.471
201	80.549	19.942	-18.235	13.972
202	80.526	20.815	-3.678	18.376

BUOY 2409 (1983)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
178	81.001	8.540		
179	80.990	8.612	1.173	1.639
180	81.020	8.633	-3.755	-.142
181	81.080	9.351	-9.661	13.024
182	81.083	9.506	-.942	2.987
183	81.055	9.716	2.633	4.741
184	81.047	9.913	.321	4.072
185	81.060	9.857	-1.428	-1.392
186	81.086	9.305	-1.473	-11.443
187	81.096	9.608	-2.295	5.740
188	81.106	9.564	-1.064	-1.071
196	79.570	-.548		
197	79.386	-1.095	23.337	-13.230
198	79.222	-1.462	20.953	-9.262
199	79.119	-1.934	12.893	-11.851
200	79.020	-2.693	11.674	-19.079
201	78.851	-3.205	21.003	-13.790
202	78.718	-3.199	17.140	-.806

BUOY 2340 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
158	80.472	-3.294		
159	80.278	-3.302	24.808	-1.608
160	80.133	-3.560	18.153	-7.196
161	80.014	-3.783	15.061	-5.484
162	79.888	-3.871	15.969	-3.070
163	79.748	-4.125	17.506	-7.019
164	79.651	-4.375	12.036	-6.688
165	79.541	-4.729	13.411	-9.358
166	79.455	-5.129	10.193	-10.318
167	79.422	-5.397	3.624	-6.702
168	79.342	-5.514	9.951	-3.743
169	79.203	-5.332	18.165	2.664
170	78.990	-5.336	27.286	-2.653
171	78.729	-5.525	32.881	-7.853
172	78.522	-5.446	26.683	-.540
173	78.345	-5.006	23.651	9.278
174	78.049	-4.702	38.482	4.812
175	77.614	-5.067	54.816	-14.691
176	77.459	-5.855	17.745	-23.790
177	77.511	-6.051	-7.191	-4.777
178	77.670	-5.697	-19.798	6.374
179	77.704	-5.693	-3.851	6.045
180	77.562	-5.530	18.554	2.714
181	77.431	-5.217	17.653	7.157
182	77.247	-5.366	23.040	-7.020
183	77.255	-5.660	-1.767	-7.629
184	77.247	-5.599	1.169	1.624
185	77.177	-5.991	7.837	-12.082
186	77.264	-5.955	-10.953	2.170
187	77.320	-5.472	-5.815	14.415
188	77.150	-5.246	22.325	4.395
189	76.913	-6.157	27.604	-29.368
190	76.833	-6.626	8.725	-14.918
191	76.708	-7.096	14.206	-15.690
192	76.628	-7.201	9.821	-4.388
193	76.318	-7.280	39.232	-7.392
194	76.092	-8.236	24.773	-33.191
195	75.816	-8.891	31.903	-25.672
196	75.659	-9.766	15.410	-30.985
197	75.583	-10.677	4.349	-30.566
198	75.351	-11.275	25.641	-24.809
199	75.197	-11.197	19.914	-1.312
200	75.151	-11.210	5.699	-1.564
201	75.142	-11.398	-.184	-6.371
202	75.083	-11.638	5.885	-9.352
203	74.991	-11.833	10.199	-8.820
204	74.927	-11.921	7.488	-4.588
205	74.857	-12.403	5.249	-17.828
206	74.629	-12.960	24.455	-25.015
207	74.477	-13.208	17.045	-12.791
208	74.461	-13.136	2.644	1.947
209	74.520	-13.073	-6.906	3.871
210	74.534	-12.939	-.756	4.952
211	74.463	-13.257	6.448	-12.861
212	74.265	-13.715	20.668	-21.504
213	74.157	-14.414	7.475	-27.385
214	74.030	-14.567	14.367	-9.360
215	73.934	-14.620	11.489	-4.946
216	73.928	-14.377	2.956	8.262
217	73.952	-14.597	-4.961	-6.867
218	73.840	-15.030	9.873	-16.810
219	73.747	-15.190	10.026	-8.725
220	73.665	-15.291	9.204	-6.332
221	73.583	-15.391	9.204	-6.332
222	73.440	-15.256	19.043	-.043

BUOY 2341 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
181	80.269	-2.936		
182	80.233	-2.781	4.840	3.141
183	80.211	-2.793	2.752	-.398
184	80.164	-3.079	5.730	-6.587
185	80.054	-3.645	13.391	-13.359
186	79.914	-3.369	18.330	5.097
187	79.761	-2.943	20.125	6.607
188	79.496	-3.032	33.910	-3.843
189	79.198	-3.880	36.900	-22.524
190	78.989	-3.854	26.843	-1.172
191	78.657	-3.822	42.585	-2.060
192	78.316	-3.821	43.695	-2.896
193	78.096	-4.547	26.787	-21.201
194	77.763	-4.634	42.428	-5.745
195	77.360	-3.895	53.106	16.692
196	77.103	-3.948	32.807	-3.787
197	76.793	-4.689	38.115	-24.602
198	76.632	-4.754	20.452	-3.822
199	76.579	-4.611	7.070	2.723
200	76.568	-4.575	1.485	.970
201	76.590	-4.540	-2.743	1.263
202	76.552	-4.397	5.298	3.906
203	76.436	-4.466	14.630	-3.231
204	76.325	-4.668	13.702	-7.289

BUOY 2342 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)	DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
158	79.861	-.283							
159	79.517	-1.288	43.816	-23.840					
160	79.342	-1.843	22.111	-13.751					
161	79.162	-2.637	22.335	-20.023					
162	78.999	-3.081	20.365	-11.879					
163	78.667	-3.196	42.449	-5.232					
164	78.389	-3.079	35.846	1.062					
165	77.991	-3.875	49.692	-24.126					
166	77.766	-3.470	29.480	9.132					
167	77.415	-3.805	44.397	-12.159					
168	77.387	-2.636	5.549	32.752					
169	77.080	-1.639	40.240	21.246					
170	76.878	-3.457	23.662	-48.360					
171	76.653	-5.482	24.135	-62.131					
172	76.517	-6.125	15.414	-20.992					
173	76.463	-6.178	6.762	-2.346					
174	76.498	-5.986	43.795	6.253					
175	76.405	-6.022	11.693	-2.332					
176	76.203	-6.333	24.776	-12.277					
177	76.169	-6.606	3.366	-8.956					
178	76.154	-6.722	1.529	-3.756					
179	76.109	-6.622	6.104	2.438					
180	76.028	-6.575	10.436	.275					
181	75.977	-6.625	6.377	-2.314					
182	75.889	-7.041	9.656	-14.385					
183	75.839	-7.356	5.135	-10.669					
184	75.769	-7.483	8.423	-5.197					
185	75.632	-6.416	13.171	-32.083					

BUOY 2345 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
180	80.222	-1.605		
181	80.191	-1.617	4.039	-.376
182	80.154	-1.726	4.655	-2.533
183	80.115	-2.165	4.602	-9.867
184	79.973	-2.525	17.967	-8.776
185	79.740	-3.171	29.119	-16.152
186	79.580	-3.740	19.713	-14.412
187	79.428	-4.058	16.934	-8.791
188	79.256	-4.502	21.233	-12.225
189	78.991	-4.959	33.016	-13.911
190	78.845	-4.785	19.110	2.716
191	78.642	-4.587	26.310	2.850
192	78.465	-4.662	22.519	-3.749
193	78.372	-4.754	11.720	-3.358
194	78.333	-5.307	3.749	-14.824
195	78.410	-5.309	-9.930	.861
196	78.368	-4.829	6.489	11.968
197	78.147	-4.416	29.151	8.548
198	77.829	-4.046	41.563	6.923
199	77.562	-4.550	33.126	-16.432
200	77.359	-5.164	24.546	-19.411
201	77.170	-5.277	23.818	-5.400
202	76.891	-5.277	35.662	-3.305
203	76.633	-5.927	31.060	-22.410
204	76.297	-6.980	39.330	-36.616
205	76.135	-8.365	14.935	-45.175
206	75.975	-9.526	14.661	-39.032
207	75.791	-10.205	19.601	-25.210
208	75.661	-10.802	12.867	-21.823
209	75.593	-11.246	5.886	-15.717
210	75.544	-11.459	4.728	-7.978
211	75.454	-11.735	9.613	-11.116
212	75.272	-12.374	18.372	-25.382
213	75.247	-12.776	.366	-13.660
214	75.297	-12.988	-7.896	-5.372
215	75.307	-13.166	-2.526	-5.439
216	75.313	-12.810	1.867	11.600
217	75.288	-13.055	1.273	-8.570
218	75.283	-13.277	-.966	-7.309
219	75.366	-13.560	-12.522	-6.570
220	75.425	-13.581	-7.594	1.106
221	75.370	-13.749	5.624	-7.013
222	75.393	-13.952	-4.511	-5.734
223	75.405	-14.271	-4.053	-9.751
224	75.548	-15.139	-24.925	-22.690
225	75.692	-15.293	-19.148	.081
226	75.721	-15.119	-2.057	6.352
227	75.701	-14.975	3.643	3.795
228	75.701	-14.649	2.658	10.095
229	75.739	-14.250	-1.596	13.586
230	75.931	-13.739	-19.910	21.698
231	75.953	-13.413	-.364	10.656
232	75.851	-13.423	12.642	-3.355
233	75.915	-13.447	-8.137	1.162
234	75.898	-13.422	2.287	.266
235	75.955	-13.155	-5.235	9.897
236	75.943	-13.076	2.086	2.070
237	76.026	-12.405	-5.705	22.896
238	75.969	-11.602	12.318	23.142
239	75.899	-11.206	11.363	10.432
240	75.830	-11.056	9.631	2.977
241	75.772	-11.044	7.310	-1.051
242	75.706	-11.559	5.071	-17.797
243	75.729	-11.673	-3.575	-3.003
244	75.559	-12.325	16.952	-25.030
245	75.439	-12.686	12.584	-14.814
246	75.383	-13.066	4.188	-13.713

BUOY 2345 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
247	75.343	-13.580	1.160	-17.611
248	75.256	-13.804	8.623	-9.737
249	75.235	-13.946	1.727	-5.275
250	75.227	-14.041	.256	-3.305
251	75.212	-14.107	1.327	-2.585
252	75.159	-14.302	4.961	-7.909
253	75.030	-14.251	16.512	-2.468
254	75.032	-14.091	1.099	5.276
255	75.082	-14.006	-5.581	4.317
256	75.231	-13.837	-17.249	10.074
257	75.462	-13.390	-25.354	21.260
258	75.536	-13.667	-11.768	-7.093
259	75.504	-14.398	-1.293	-23.469
260	75.501	-14.758	-2.572	-11.431
261	75.427	-14.822	8.665	-4.433
262	75.220	-14.955	24.545	-11.067
263	75.080	-15.265	14.682	-1[illegible].653
264	74.975	-15.935	6.928	-25.268
265	74.824	-16.627	12.002	-27.885
266	74.663	-16.946	16.628	-16.410
267	74.355	-17.252	34.718	-21.819
268	74.264	-17.293	8.219	-4.069
269	74.189	-17.608	8.300	-14.275
270	74.210	-17.611	-4.710	-6.025
271	74.192	-18.025	-.137	-7.918
272	74.322	-17.859	-14.112	10.706
273	74.215	-18.153	9.979	-14.114
274	74.100	-18.672	8.096	-22.128

BUOY 2346 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
158	80.001	.345		
159	79.532	-.212	60.205	-12.725
160	79.328	-.255	26.154	-1.106
161	79.204	.527	15.951	16.839
162	79.123	1.272	10.138	18.253
163	78.960	1.818	20.567	13.976
164	78.922	1.470	5.023	-8.490
165	79.063	1.770	-16.293	6.887
166	79.017	2.818	4.854	25.972
167	78.897	2.980	15.294	4.782
168	78.954	3.297	-7.760	7.441
169	78.738	2.743	28.347	-12.353
170	78.688	2.271	-18.628	-12.670
171	78.697	3.156	-2.301	21.950
172	78.813	1.840	12.325	-32.370
173	78.886	-.111	-6.671	-46.890
174	79.015	-.658	-16.684	-13.430
175	78.997	-1.856	1.694	-29.578
176	78.773	-3.092	27.423	-31.994
177	78.605	-3.402	21.000	-9.055
178	78.443	-3.274	21.019	2.065
179	78.190	-3.213	32.544	-.244
180	77.947	-3.247	31.048	-2.659
181	77.926	-3.390	2.495	-4.034
182	77.626	-3.942	11.916	-15.790
183	77.567	-4.176	32.608	-6.782
184	77.326	-3.688	31.847	11.575
185	77.009	-4.236	39.580	-18.602
186	76.826	-4.846	21.986	-19.623
187	76.753	-5.560	7.452	-21.907
188	76.583	-6.466	18.788	-29.213
189	76.229	-7.362	41.627	-32.559
190	75.978	-8.224	28.380	-30.974
191	75.849	-8.636	14.437	-15.306
192	75.819	-9.026	1.973	-12.817
193	75.762	-9.300	3.213	-9.358
194	75.670	-10.056	10.147	-26.252
195	75.500	-10.596	16.376	-21.086
196	75.415	-10.579	10.839	-1.486
197	75.336	-10.337	11.393	5.966
198	75.135	-10.574	23.962	-12.392
199	75.116	-10.640	1.915	-2.603
200	75.058	-11.139	4.234	-17.792
201	74.929	-11.585	13.262	-17.952
202	74.835	-11.924	9.478	-13.700
203	74.797	-12.119	3.394	-7.502
204	74.757	-12.037	5.559	1.651
205	74.652	-12.444	10.266	-16.493
206	74.495	-12.708	17.745	-13.313
207	74.375	-12.672	15.266	-2.145
208	74.372	-12.442	2.190	7.768
209	74.347	-12.190	4.906	7.964
210	74.321	-11.974	4.900	6.689
211	74.201	-11.866	15.889	.553
212	74.020	-11.942	22.187	-7.428
213	74.035	-11.939	-1.876	.493
214	74.033	-11.692	2.073	8.579
215	73.953	-11.166	13.792	16.424
216	74.000	-10.251	.186	33.480
217	74.235	-9.569	-25.666	26.403
218	74.254	-9.285	-.626	10.993
219	74.396	-8.615	-14.420	26.071
220	74.652	-7.658	-27.781	37.509
221	74.906	-7.130	-30.030	22.084
222	75.108	-6.906	-25.095	8.637
223	75.218	-6.340	-11.556	22.323
224	75.413	-6.757	-26.503	-10.778

BUOY 2346 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
225	75.525	-6.865	-14.720	-1.787
226	75.583	-7.950	-11.945	-33.875
227	75.680	-8.667	-15.561	-21.057
228	75.604	-9.078	7.517	-14.569
229	75.486	-9.603	12.264	-19.239
230	75.463	-9.806	1.819	-7.043
231	75.374	-10.053	9.860	-9.916
232	75.065	-10.907	33.834	-35.006
233	74.912	-11.004	18.658	-6.948
234	74.566	-11.972	36.946	-41.288
235	74.628	-11.825	-6.689	6.573
236	74.322	-12.300	34.861	-24.337
237	74.511	-11.851	-20.366	20.403
238	74.400	-12.002	12.833	-8.095
239	74.475	-11.696	-7.266	12.447
240	74.381	-11.849	10.813	-7.730
241	74.420	-12.211	-7.535	-11.328
242	74.316	-12.548	10.413	-14.387
243	74.268	-13.599	-2.325	-37.431
244	73.765	-14.427	55.434	-44.413
245	73.562	-14.201	27.417	1.545
246	73.452	-13.672	18.416	15.584
247	73.378	-12.926	15.570	24.825
248	73.268	-12.466	17.621	13.656
249	73.369	-12.379	-12.076	5.989
250	73.361	-12.603	-.813	-8.403
251	73.336	-13.489	-4.266	-32.938
252	73.065	-14.031	28.978	-28.111
253	72.754	-13.796	40.873	-.830
254	72.778	-13.493	-.180	12.059
255	72.643	-13.205	19.348	6.908
256	72.462	-13.194	22.756	-4.925
257	72.620	-13.164	-19.513	5.796
258	72.562	-13.703	2.381	-22.181
259	72.642	-14.474	-17.240	-26.675
260	72.816	-14.809	-24.892	-6.912
261	72.751	-14.352	12.459	14.965
262	72.417	-14.648	38.667	-21.934
263	72.080	-15.502	32.954	-44.036
264	71.626	-16.603	43.642	-59.143
265	71.258	-17.387	35.642	-44.992
266	70.999	-17.739	27.263	-24.269
267	70.753	-17.976	26.973	-19.343
268	70.613	-17.825	19.056	.720
269	70.827	-17.101	-16.779	38.056
270	71.007	-17.084	-21.916	7.517
271	71.074	-16.735	-3.922	16.654
272	71.209	-16.294	-11.316	22.816
273	71.260	-16.787	-12.170	-18.034
274	71.199	-17.381	.150	-26.148

BUOY 2347 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
158	80.645	-6.133		
159	80.536	-6.273	13.566	-4.448
160	80.440	-6.499	11.786	-6.173
161	80.379	-6.706	7.215	-5.319
162	80.337	-6.949	4.738	-5.852
163	80.290	-7.241	5.269	-7.035
164	80.261	-7.400	3.160	-3.899
165	80.213	-7.387	6.250	-.533
166	80.207	-7.291	.962	2.002
167	80.237	-7.247	-3.717	1.440
168	80.229	-7.196	1.166	.975
169	80.196	-7.001	4.725	3.718
170	80.207	-6.817	-.849	4.188
171	80.208	-6.917	-.373	-2.181
172	80.226	-6.910	-2.340	.442
173	80.261	-6.830	-4.212	2.286
174	80.310	-6.717	-6.043	3.190
175	80.350	-6.467	-4.427	5.967
176	80.323	-6.826	2.520	-8.118
177	80.291	-7.219	3.104	-8.999
178	80.303	-6.948	-.804	6.055
179	80.331	-6.698	-2.974	5.814
180	80.292	-6.773	4.829	-2.220
181	80.292	-6.639	.326	2.897
182	80.283	-6.644	1.125	-.233
183	80.277	-6.586	.952	1.168
184	80.221	-6.687	6.777	-3.012
185	80.152	-6.985	8.106	-7.573
186	80.108	-6.828	5.967	2.765
187	80.074	-6.592	5.017	4.689
188	80.013	-6.720	7.391	-3.744
189	79.856	-6.828	19.543	-4.776
190	79.721	-6.667	17.859	1.612
191	79.567	-6.569	17.417	.270
192	79.518	-6.321	9.351	4.777

BUOY 2348 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
179	80.237	.417		
180	79.992	-.384	31.434	-17.755
181	79.977	-1.503	1.334	-25.132
182	79.808	-1.797	21.548	-7.279
183	79.543	-1.810	34.051	-1.381
184	79.476	-1.170	8.947	14.807
185	79.454	-.763	3.037	9.581
186	79.506	-.249	-6.678	12.177
187	79.618	-.431	-14.341	-4.176
188	79.646	-1.299	-4.217	-20.111
189	79.378	-1.747	34.479	-11.452
190	79.144	-1.953	29.800	-5.926
191	78.982	-2.225	20.494	-7.411
192	78.847	-2.702	16.911	-12.607
193	78.728	-3.103	14.661	-10.820
194	78.330	-3.041	51.141	-1.146
195	78.145	-2.532	24.377	12.245
196	77.854	-2.336	37.563	3.621
197	77.730	-1.567	16.705	20.551
198	77.592	-1.481	17.757	1.667
199	77.478	-1.695	14.402	-6.364
200	77.377	-1.593	13.154	2.502
201	77.291	-1.386	11.105	5.588
202	77.204	-1.390	11.155	-.399
203	77.126	-1.529	9.951	-4.239
204	77.035	-1.742	11.503	-6.513

BUOY 2407 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
181	80.676	-5.679		
182	80.697	-5.723	-2.795	-.640
183	80.697	-5.880	-.276	-3.258
184	80.665	-6.260	3.234	-6.324
185	80.603	-6.554	7.167	-7.030
186	80.582	-6.417	3.087	2.564
187	80.554	-6.218	4.019	3.781
188	80.521	-6.246	4.130	-1.049
189	80.424	-6.459	11.906	-5.888
190	80.348	-6.299	10.040	2.349
191	80.259	-6.234	11.502	.143
192	80.235	-5.941	3.776	6.053
193	80.230	-5.806	.986	2.863
194	80.202	-5.690	3.761	2.171
195	80.218	-5.341	-1.268	7.812
196	80.196	-5.175	2.869	3.403
197	80.173	-5.100	3.316	1.371
198	80.168	-5.064	.806	.723
199	80.180	-4.811	-1.090	5.685
200	80.166	-4.384	2.515	9.226
201	80.124	-4.167	5.700	4.384
202	80.052	-3.962	9.586	3.890
203	79.908	-3.963	18.441	-1.301
204	79.792	-4.512	13.997	-13.575
205	79.720	-5.079	8.045	-13.733
206	79.638	-5.456	9.670	-9.641
207	79.514	-5.652	15.420	-6.097
208	79.424	-5.584	11.671	.453
209	79.337	-5.086	12.283	10.752
210	79.172	-3.803	23.514	29.182
211	78.943	-3.460	29.872	6.526
212	78.586	-3.935	44.891	-14.896
213	78.255	-4.325	41.718	-13.156
214	77.888	-4.575	46.457	-10.312
215	77.620	-5.198	32.812	-19.964
216	77.489	-5.034	17.233	3.050
217	77.187	-4.546	39.760	10.544
218	76.919	-4.734	33.857	-8.201
219	76.808	-5.237	12.909	-16.008
220	76.742	-5.599	7.426	-11.472
221	76.738	-6.286	-1.659	-20.352
222	76.778	-6.674	-6.391	-10.873
223	76.745	-6.910	3.383	-7.455
224	76.807	-7.409	-9.747	-13.672
225	76.844	-7.424	-4.728	.174
226	76.887	-7.439	-5.478	.256
227	76.992	-7.432	-13.409	1.977
228	77.104	-7.350	-13.933	4.198
229	77.195	-7.247	-11.200	4.429
230	77.367	-7.070	-21.345	7.749
231	77.410	-6.987	-5.207	3.022
232	77.326	-7.338	9.451	-11.219
233	77.339	-7.504	-2.211	-4.467
234	77.338	-7.854	-1.215	-9.853
235	77.332	-7.845	.839	.153
236	77.304	-8.049	2.721	-6.225
237	77.345	-8.211	-5.863	-3.816
238	77.375	-7.965	-2.808	7.427

BUOY 2408 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
158	80.687	-.119		
159	80.366	-.767	41.139	-14.092
160	80.112	-1.269	32.449	-11.553
161	79.841	-1.508	34.623	-6.205
162	79.608	-1.964	29.576	-11.409
163	79.507	-2.515	12.468	-13.391
164	79.410	-2.891	12.059	-9.465
165	79.302	-3.275	13.308	-9.897
166	79.280	-3.991	1.728	-17.326
167	79.195	-4.598	9.764	-15.418
168	78.967	-5.026	28.291	-12.897
169	78.722	-4.440	32.515	12.020
170	78.4[illegible]	-3.990	36.209	8.884
171	78.036	-4.502	51.573	-17.372
172	77.601	-4.692	55.266	-9.658
173	77.383	-4.717	27.755	-2.979
174	77.204	-4.864	22.652	-6.095
175	77.088	-5.420	13.402	-17.306
176	76.840	-6.104	29.586	-23.053
177	76.534	-6.745	36.987	-23.418
178	76.245	-7.554	33.690	-29.090
179	75.998	-8.507	27.304	-33.796
180	75.790	-8.706	25.428	-10.210
181	75.699	-8.905	10.598	-8.076
182	75.622	-9.225	8.093	-11.707
183	75.530	-9.489	10.367	-10.352
184	75.445	-9.601	10.109	-5.398
185	75.316	-10.178	13.124	-21.474
186	75.199	-10.879	10.446	-25.513
187	75.016	-11.437	19.498	-22.825
188	74.867	-11.650	17.317	-10.886
189	74.697	-11.810	20.241	-9.746
190	74.585	-11.712	14.810	.346

BUOY 2409 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
158	80.266	-1.526		
159	80.061	-1.768	26.142	-6.090
160	79.900	-2.272	20.341	-12.042
161	79.758	-2.590	17.850	-8.010
162	79.619	-2.903	17.520	-8.073
163	79.447	-3.494	21.266	-15.093
164	79.321	-4.160	15.081	-16.885
165	79.144	-4.568	21.884	-11.548
166	78.991	-4.361	20.096	3.536
167	78.852	-3.969	18.453	8.417
168	78.541	-3.610	40.460	6.437
169	78.146	-3.741	50.440	-6.683
170	77.760	-3.959	49.020	-9.200
171	77.433	-4.053	41.753	-5.527
172	77.118	-4.446	39.490	-14.183
173	76.900	-4.967	26.619	-17.427
174	76.725	-5.841	19.955	-27.832
175	76.477	-6.829	28.373	-32.990
176	76.173	-7.591	35.818	-26.065
177	75.933	-7.985	28.784	-16.393
178	75.812	-8.430	13.455	-16.166
179	75.730	-9.146	6.853	-24.163
180	75.612	-10.045	10.198	-31.013
181	75.432	-10.489	20.098	-18.276
182	75.234	-11.149	20.934	-26.098
183	75.078	-11.557	17.018	-17.263
184	74.922	-12.116	15.759	-22.490
185	74.609	-12.426	37.020	-18.868
186	74.372	-13.102	24.479	-29.637
187	74.206	-13.159	20.213	-6.794
188	74.111	-13.123	12.203	-1.550
189	73.968	-13.322	16.237	-11.123
190	73.866	-12.939	15.879	10.499
191	73.797	-12.512	12.087	13.117
192	73.840	-12.072	-2.014	16.756
193	74.016	-11.394	-17.132	28.509
194	74.064	-11.155	-4.425	9.602
195	74.102	-11.203	-5.050	-.738
196	74.114	-11.265	-1.989	-1.660
197	74.114	-11.289	-.138	-.836
198	74.089	-11.030	4.949	6.401
199	74.088	-11.167	-.901	-4.779
200	74.155	-11.440	-10.311	-7.639
201	74.199	-11.654	-6.964	-6.319
202	74.262	-11.833	-9.319	-4.527
203	74.322	-11.690	-6.518	6.497
204	74.314	-11.439	2.826	8.427
205	74.253	-11.337	8.438	1.952
206	74.113	-11.167	16.698	2.440
207	74.063	-11.207	6.118	-2.663
208	74.097	-11.046	-3.155	6.459
209	74.230	-10.561	-13.666	20.126
210	74.394	-10.351	-19.300	11.069
211	74.440	-10.472	-6.568	-3.083
212	74.258	-11.204	18.164	-29.623
213	74.240	-11.523	-.036	-11.467
214	74.224	-11.274	3.771	8.198
215	74.111	-11.026	15.924	5.842
216	74.103	-10.261	6.119	26.557
217	74.244	-9.857	-15.383	17.284
218	74.296	-9.396	-3.800	17.144
219	74.399	-8.831	-10.014	21.680
220	74.744	-7.980	-39.508	35.573
221	75.074	-7.385	-39.267	25.604
222	75.292	-7.352	-27.672	4.696
223	75.417	-6.605	-12.911	26.294
224	75.561	-7.236	-20.797	-18.176

BUOY 2409 (1984)

DAY	LAT (N)	LONG (E)	U (CM/S)	V (CM/S)
225	75.706	-7.875	-21.202	-17.926
226	75.726	-8.563	-5.632	-21.455
227	75.534	-9.210	21.053	-24.362
228	75.419	-10.408	7.993	-40.955
229	75.316	-11.456	6.420	-36.318
230	75.463	-11.434	-18.365	4.513
231	75.517	-11.336	-6.143	4.408
232	75.298	-11.753	24.749	-18.877
233	75.112	-12.002	21.745	-13.041
234	74.960	-12.669	14.246	-26.001
235	74.979	-12.877	-3.968	-6.269